

U.S. Circuit Court. So. Dist. of West Virginia.	
National Phonograph Co.	} In Equity on Letters Patent No. 683,615.
versus	
American Graphophone Co.)	
National Phonograph Co.)	} In Equity on Letters Patent No. 683,676.
versus	
American Graphophone Co.)	
New Jersey Patent Co.)	} In Equity on Letters Patent No. 831,668.
versus	
American Graphophone Co)	
CONSOLIDATED RECORD 1905 - 1909	

---

---

**United States Circuit Court**  
**SOUTHERN DISTRICT OF WEST VIRGINIA**

---

---

NATIONAL PHONOGRAPH COMPANY,  
*Complainant,*

*vs.*

AMERICAN GRAPHOPHONE COMPANY,  
*Defendant.*

---

In Equity on  
Letters Patent  
No. 683,615.

---

NATIONAL PHONOGRAPH COMPANY,  
*Complainant,*

*vs.*

AMERICAN GRAPHOPHONE COMPANY,  
*Defendant.*

---

In Equity on  
Letters Patent  
No. 683,676.

---

NEW JERSEY PATENT COMPANY,  
*Complainant,*

*vs.*

AMERICAN GRAPHOPHONE COMPANY,  
*Defendant.*

---

In Equity on  
Letters Patent  
No. 831,668.

---

---

**CONSOLIDATED RECORD**

---

---

PRICE, SMITH, SPILMAN AND CLAY,  
*Solicitors for Complainants.*

FRANK L. DYER,  
HERBERT H. DYKE,  
*Of Counsel for Complainants.*

PHILIP MAURO,  
C. A. L. MASSIE,  
*Solicitors and of Counsel for Defendant.*

---

---

ESSEX PRESS, LAW PRINTERS, NEWARK, N. J.



# INDEX.

	Page.
BILL OF COMPLAINT ON LETTERS PAT-	
ENT NO. 683,615.....	1
Answer of Defendant on Letters Patent No.	
683,615 .....	7
Replication on Letters Patent No. 683,615....	14
Stipulation for use of testimony and exhibits	
in companion suit on Letters Patent No.	
683,676 .....	15
PETER WEBER.	
Direct examination .....	16
Cross examination .....	20
Re-direct examination .....	24
Defendant's stipulated admission of its prac-	
tice in molding phonographic records.....	25
L. SEWARD BACON.	
Direct examination .....	27
Cross examination .....	43
Re-direct examination .....	73
Complainants' <i>prima facie</i> case on Letters	
Patent No. 683,615, closed.....	73
BILL OF COMPLAINT ON LETTERS PAT-	
ENT NO. 683,676.....	74
Answer on Letters Patent No. 683,676.....	81
Replication on Letters Patent No. 683,676....	87
Stipulation for use of testimony and exhibits	
in companion suit on Letters Patent No.	
683,615 .....	89
PETER WEBER.	
Direct examination .....	90
Cross examination .....	94
Re-direct examination .....	97
Stipulated admission of defendant's practice	
of molding phonograph records.....	99

	Page.
L. SEWARD BACON.	
Direct examination .....	100
Cross examination .....	117
Complainants' <i>prima facie</i> case on Letters Patent No. 683,676, closed.....	119
BILL OF COMPLAINT ON LETTERS PAT- ENT NO. 831,668.....	
Answer on Letters Patent No. 831,668.....	127
Replication on Letters Patent No. 831,668....	134
JOSEPH F. MCCOY.	
Direct examination .....	135
Cross examination .....	140
Re-direct examination .....	148
PETER WEBER.	
Direct examination .....	150
Cross examination .....	157
Stipulated admission of defendant's practice of molding phonograph records.....	161
THOMAS H. MACDONALD.	
Direct examination .....	165
Cross examination .....	166
Re-direct examination .....	167
DELOS HOLDEN.	
Direct examination .....	168
Cross examination .....	182
Complainants' <i>prima facie</i> case on Letters Patent No. 831,668, closed.....	211

#### DEFENDANT'S PROOFS.

Stipulation consolidating the three suits on Letters Patent Nos. 683,615, 683,676 and 831,668, for taking of proofs, etc., from this point on, and providing for introduction of testimony from Connecticut suits.....	213
--	-----



Page.
..... 100
..... 117
etters
..... 119
PAT-
..... 120
..... 127
S..... 134
..... 135
..... 140
..... 148
..... 150
..... 157
actice
..... 161
..... 165
..... 166
..... 167
..... 168
..... 182
etters
..... 211
ts on
and
a this
on a
..... 213

Page.
Introduction of depositions of E. E. Norton, T. H. Macdonald, A. A. Stevenson, F. H. Osborne and Thomas A. Edison from Con- necticut suits ..... 213
THOMAS H. MACDONALD.
Direct examination ..... 214
Cross examination ..... 223
Stipulated testimony of Philip Mauro..... 230
Objections to Mauro's testimony..... 236
C. A. L. MASSIE.
Direct examination ..... 237
Objections to Massie's testimony..... 284
Cross examination ..... 285
Re-direct examination ..... 306
Defendant's proofs in the three consolidated suits closed ..... 321
COMPLAINANTS' REBUTTAL PROOFS IN THE THREE CONSOLIDATED CASES.. 322
MARTIN SHANNON.
Direct examination ..... 322
Cross examination ..... 325
Stipulation for retention of exhibits by the party introducing same..... 328
MARTIN SHANNON ( <i>Recalled</i> ).
Direct examination ..... 328
Cross examination ..... 328
Re-direct examination ..... 330
MAURICE JOYCE.
Direct examination ..... 333
Cross examination ..... 346
Re-direct examination ..... 364
Re-cross examination ..... 367

	Page.
MAURICE E. JOYCE.	
Direct examination .....	368
Cross examination .....	371
Stipulation .....	377
WALTER H. MILLER.	
Direct examination .....	377
Cross examination .....	388
ALEXANDER N. PIERMAN.	
Direct examination .....	394
Cross examination .....	403
ARTHUR S. BROWNE.	
Direct examination .....	414
Cross examination .....	466
Re-direct examination .....	508
Re-cross examination .....	510
Stipulation as to material used by Joyce.....	511
ROBERT FLETCHER ROGERS.	
Direct examination .....	512
Cross examination .....	517
Stipulated testimony of David Dodd.....	518
Stipulated testimony of Frank L. Dyer.....	518
Complainants' proofs in three consolidated cases closed .....	531



## Page.

## LIST OF COMPLAINANTS' EXHIBITS.

## Introduced

## AT PAGE

.... 368	Patent No. 683,615 in suit.....	15
.... 371	Defendant's Apparatus Drawing No. 1.....	18
.... 377	Defendant's Apparatus Drawing No. 2.....	18
.... 377	Weber's Reproduction of Defendant's Mold...	20
.... 388	Weber's Reproduction of Reaming Tool.....	20
	Patent No. 683,676 in suit.....	89
	Defendant's Apparatus Drawing No. 1.....	91
.... 394	Defendant's Apparatus Drawing No. 2.....	91
.... 403	McCoy Report.....	139
	Patent No. 831,668 in suit.....	149
.... 414	Defendant's Apparatus Drawing No. 1.....	151
.... 466	Defendant's Apparatus Drawing No. 2.....	152
.... 508	Defendant's Apparatus Drawing No. 3.....	153
.... 510	Commercial Joyce Apparatus.....	327-328
.... 511	Joyce Mold No. 1.....	336
	Joyce Mold No. 2.....	336
	Joyce Mold No. 3.....	336
.... 512	Joyce Base No. 1.....	336
.... 517	Joyce Base No. 2.....	336
.... 518	Joyce Core .....	336
.... 518	Robert Fletcher Rogers' Letter to Joyce, July	
lated	5, 1898.....	344
.... 531	Easton's Letter to Rogers.....	345
	Miller-Pierman Patent No. 726,965.....	382
	Miller-Pierman Patent No. 726,966.....	382
	Brannt—Manufacture of Soap & Candles—	
	1888 .....	466
	Carpenter—Soap & Candles—1885.....	466
	Ott—Soap & Candles, 1867.....	466
	Edison British Patent No. 1644, of April 24,	
	1878 .....	466
	Edison Patent No. 200,521, Feb. 8, 1878.....	466
	Bell & Tainter Patent No. 341,214, May 4, 1886	466
	Tainter Patent No. 341,287, May 4, 1886.....	466
	Tainter Patent No. 341,288, May 4, 1886.....	466

## Introduced

## AT PAGE.

Edison Patent No. 382,419, May 8, 1888.....	466
Edison Patent No. 382,462, May 8, 1888.....	466
Herrington Patent No. 399,264, March 12, 1889	466
Herrington Patent No. 399,265, March 12, 1889	466
Edison Patent No. 430,274, June 17, 1890.....	466
Douglass Patent No. 475,490, May 24, 1892...	466
Bettini Patent No. 488,381, Dec. 20, 1892.....	466
Edison Patent No. 484,582, Oct. 18, 1892.....	466
Edison Patent No. 484,584, Oct. 18, 1892.....	466
Amet Patent No. 539,212, May 14, 1895.....	466
Amet Patent No. 545,439, Sept. 3, 1895.....	466
Macdonald Patent No. 559,806, May 12, 1896..	466
Aylsworth Patent No. 782,375, Feb. 14, 1905..	466
Record made from Ordinary Blank Composi- tion by Commercial Joyce Process.....	508
Record made after oiling the mold and core...	509
Third Joyce Record.....	509
Early Joyce Record.....	
Cameron Deposition in Connecticut suit on Edison Patent No. 713,209 .....	527
Berliner Patent of Nov. 8, 1887, No. 372,786...	528
Edison Patent of May 8, 1888, No. 382,417....	528
Edison Patent of April 2, 1889, No. 400,649...	528
Heysinger Patent of Sept. 29, 1891, No. 460,338	528
Macdonald Patent of July 5, 1898, No. 606,725.	528
Tainter Patent of March 26, 1901, No. 670,442.	528
British Patent of Berliner, 1887, No. 15,232...	528
Certified copy of Defendant's Affidavits in its suit against Walcutt & Leeds.....	529
Photograph of Joyce Original Mold, Core and Base .....	529
Photograph of Commercial Joyce Apparatus, Unassembled .....	529
Photograph of Commercial Joyce Apparatus Assembled .....	529
Photograph of Weber's Reproduction of De-	



## Introduced

## AT PAGE.

388.....	466
388.....	466
h 12, 1889	466
h 12, 1889	466
1890.....	466
1, 1892...	466
1892.....	466
892.....	466
892.....	466
895.....	466
95.....	466
12, 1896..	466
14, 1905..	466
Composi-	
ss.....	508
nd core...	509
.....	509
.....	
it suit on	
.....	527
372,786...	528
32,417....	528
400,649...	528
No. 4,0,338	528
o. 606,725.	528
o. 670,442.	528
15,232...	528
bits in its	
.....	529
, Core and	
.....	529
Apparatus,	
.....	529
Apparatus	
.....	529
on of De-	

Defendant's Reaming Tool.....	529
Photograph of Weber's Reproduction of De-	
fendant's Mold and Core Unassembled....	530
Photograph of Weber's Reproduction of De-	
fendant's Mold and Core Assembled.....	530

## LIST OF DEFENDANT'S EXHIBITS.

## Introduced

## AT PAGE

"Defendant's Exhibit, Certified Copy File	
Wrapper and Contents of Joyce Patent in	
Suit" .....	282
"Defendant's Exhibit, Photograph 1895 Mold".	213
"Defendant's Exhibit, Photograph 1899 Mold,	
No. 1 and No. 2" .....	213
"Defendant's Exhibit, British Patent to Field	
& Humfrey, of 1856" .....	282
"Defendant's Exhibit, Young's British Patent	
of 1894" .....	282
"Defendant's Exhibit, Cowles Patent, No.	
86,059" .....	282
"Defendant's Exhibit, Brunner Patent, No.	
95,645" .....	282
"Defendant's Exhibit, Bingham Patent, No.	
182,547" .....	282
"Defendant's Exhibit, Wilder Patent, No.	
185,054" .....	282
"Defendant's Exhibit, Appelt Patent, No.	
303,970" .....	282
"Defendant's Exhibit, Schuberth Patent, No.	
359,637" .....	282
"Defendant's Exhibit, Edison Patent, No.	
393,462" .....	282
"Defendant's Exhibit, Edison Patent, No.	
393,463" .....	282
"Defendant's Exhibit, Edison Patent, No.	
414,761" .....	282
"Defendant's Exhibit, Bingham Patent, No.	
419,914" .....	282

	Introduced AT PAGE.
"Defendant's Exhibit, Lioret Patent, No. 528,273" .....	282
"Defendant's Exhibit, Fournier Patent, No. 545,356" .....	282
"Defendant's Exhibit, Edison Patent, No. 667,662" .....	282
"Defendant's Exhibit, Edison Patent, No. 713,209" .....	283
"Defendant's Exhibit, Scientific American Cyclopedia of 1893" .....	282
"Defendant's Exhibit, Grove's & Thorp of 1895" .....	282
"Defendant's Exhibit, Soaps & Candles of 1896" .....	282
"Defendant's Exhibit, Depositions of Norton, Macdonald, Stevenson and Osborne" .....	213
"Defendant's Exhibit, Deposition of Thomas A. Edison" .....	214
"Defendant's Exhibit, Transcript in Connecticut Suit on Edison Pressing Process." (2 Vols.) marked for identification .....	283
"Defendant's Exhibit, Transcript in Connecticut Suit on Edison Casting Process." (2 Vols.) marked for identification .....	283



Introduced  
 AT PAGE.  
 tent, No. .... 282  
 tent, No. .... 282  
 tent, No. .... 282  
 tent, No. .... 283  
 American  
 .... 282  
 Thorp of  
 .... 282  
 and'es of  
 .... 282  
 of Norton,  
 orne"..... 213  
 Thomas A.  
 .... 214  
 i Connecti-  
 rocess." (2  
 .... 283  
 i Connecti-  
 ocess." (2  
 .... 283

# United States Circuit Court

UNITED STATES CIRCUIT COURT

Southern District of West Virginia.

10

NATIONAL PHONOGRAPH COM-  
PANY,

*Complainant,*

*vs.*

AMERICAN GRAPHOPHONE COM-  
PANY,

*Defendant.*

In Equity, on  
 Letters Patent  
 No. 683,615.

20

## BILL OF COMPLAINT

*To the Honorable, the Judges of the United States  
 Circuit Court for the Southern District of  
 West Virginia.*

NATIONAL PHONOGRAPH COMPANY, a corporation  
 organized and existing under and by virtue of the  
 laws of the State of New Jersey, and having its  
 principal place of business at West Orange, in the  
 County of Essex and State of New Jersey, brings  
 this, its bill of complaint, against American  
 Graphophone Company, a corporation organized  
 and existing under the laws of the State of West  
 Virginia and a citizen and resident of said State.

30

And thereupon your orator complains and says:

I. That heretofore and before the 31st day of  
 July, 1900, Walter Henry Miller and Jonas Walter

40

Aylsworth, being then as now residents of Orange and East Orange, respectively, in the County of Essex and State of New Jersey, and both citizens of said State, were the original first and joint inventors of a certain new and useful improved method of duplicating phonographic records, not known or used by others in this country before their invention or discovery thereof, and not patented or described in any printed publication in this or any  
10 foreign country before their invention or discovery thereof, or more than two years prior to their application for a patent therefor in this country as hereinafter set forth, and not in public use or on sale in this country for more than two years prior to their said application, and which had not been abandoned; and which invention or improvement was not first patented or caused to be patented by the said inventors or their legal representatives or  
20 assigns in a foreign country upon an application filed more than seven months prior to the filing of the said application in this country.

II. That the said Miller and Aylsworth, being as aforesaid the first inventors and discoverers of the said improvement, on the 31st day of July, 1900, jointly made application in writing to the Commissioner of Patents of the United States for the grant of Letters Patent therefor, and paid into  
30 the Treasury of the United States the fees required by law, and then and there fully and in all respects complied with all the necessary conditions and requirements of the statutes of the United States in such case made and provided, and by a proper instrument in writing, duly executed and delivered, and duly recorded in the Patent Office, sold and assigned to your orator, National Phonograph Company, the full and entire right, title and interest in and to the said invention and application and the  
40 Letters Patent to be granted in pursuance of said



application, and requested the Commissioner of Patents to issue the said patent to your orator as their assignee, and thereupon, after due examination having been made by the Commissioner of Patents as to the novelty and utility of the said invention as provided by law, the Commissioner of Patents caused to be issued to your orator, National Phonograph Company, Letters Patent in due form of law, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing date the 1st day of October, 1901, and numbered 683,615; and that the said Letters Patent did grant unto your orator and unto its successors or assigns, for the term of seventeen years from the date thereof, the exclusive right to make, use and vend the said invention throughout the United States and the Territories thereof, as by said Letters Patent or a duly authenticated copy thereof ready in court to be produced will more fully and at large appear.

III. That your orator has been ever since the grant of said Letters Patent as aforesaid, and is now the sole and exclusive owner of said patent and the rights secured thereby, and of all claims for damages and profits arising from infringement thereof.

IV. That your orator is engaged in the manufacture of phonographic records produced by the employment of said improvement or invention, and has so manufactured and sold large quantities of such phonographic records, and has invested and expended large sums of money and has been put to great trouble in and about the said invention for the purpose of introducing the same and making the same profitable to your orator and to the public; and your orator believes that it will realize

and receive large gains and profits therefrom if infringement by the said defendant and its confederates be prevented.

10 V. That the said defendant, well knowing the premises and the rights secured to your orator as aforesaid, but contriving to injure it and to deprive it of the benefits and advantages which might and otherwise would accrue unto it from the said invention, did, after the grant of said Letters Patent and before the commencement of this suit, as your orator is informed and believes, and therefore avers, in the City of Bridgeport, State of Connecticut and elsewhere in the United States, without license or allowance and against the will of your orator and in violation of its rights, unlawfully and wrongfully make, or cause to be made, and is now making, or causing to be made, phonographic records by the employment of the said improved method of duplicating phonographic records employing and containing the invention set forth in the Letters Patent aforesaid, and did use or cause to be used, as aforesaid, the said invention in the manufacture of said phonographic records; and that it still continues so to do, and that it threatens to continue the aforesaid unlawful acts to a large extent, all in defiance of the rights secured to your orator as aforesaid, and to its great and irreparable loss and injury, and by which your orator has been and still is being deprived of great gains and profits which it might and otherwise would have obtained, but which have been received and enjoyed by the said defendant through its said unlawful acts and doings. And your orator further shows that as to how many phonographic records the defendant has as aforesaid unlawfully made, and as to the extent of the gains and profits received and enjoyed by it from such unlawful making, your orator is  
40 ignorant and prays a discovery thereof.



VI. That the manufacture of phonographic records by the employment of the invention set forth in the Letters Patent aforesaid by the defendant, and its preparation for and avowed determination to continue the same in disregard and defiance of the rights of your orator, have the effect to encourage and induce others to venture to infringe said Letters Patent.

10

VII. Your orator therefore prays that the said defendant, American Graphophone Company, and its officers, servants, agents, attorneys, employees, workmen and confederates, and each and every of them, may be perpetually restrained and enjoined, by the order and injunction of this Honorable Court, from directly or indirectly making phonographic records by the employment of the invention of the Letters Patent aforesaid, and that they, and each and every of them, be ordered to deliver to your orator or to an officer of this Court for destruction all molds and other apparatus used by the said defendant in the carrying on of said method covered by the Letters Patent aforesaid, and that the said defendant may be decreed to pay the costs of this suit, and that your orator may have such other and further relief as to this Honorable Court shall seem meet and as shall be agreeable to equity.

20

VIII. Your orator further prays that an injunction *pendente lite* be granted, issuing out of and under the seal of this Honorable Court, enjoining and restraining the said defendant and its officers, servants, agents, attorneys, employees, workmen and confederates, and each and every of them, to the same purport, tenor and effect as hereinbefore prayed for with regard to said perpetual injunction.

30

IX. And forasmuch as your orator can have no adequate relief save in this Court, to the end there-

40

fore that the said defendant may, if it can, show why your orator should not have the relief hereby prayed, and may, but not upon oath, an answer under oath being hereby expressly waived, according to the best and utmost knowledge, remembrance, information and belief of its officers, full, true, direct and perfect answer make to the premises and to all the several matters hereinbefore stated and charged, as fully and particularly as if the same were here repeated, and it especially interrogated as to each and every of said matters, and may be compelled to account for and pay to your orator the profits by it acquired, and the damages suffered by your orator from the aforesaid unlawful acts, and that the Court may assess said profits and damages, and may increase the damages to a sum not exceeding three times the amount thereof.

May it please your Honors to grant unto your orator a writ of *subpoena ad respondendum* issuing out of and under the seal of this Honorable Court, directed to the said defendant, American Graphophone Company, commanding it, by a certain day and under a certain penalty, to be and appear in this Honorable Court, then and there to answer to the premises, and to stand to and abide such order and decree as may be made against it.

And your orator will ever pray.

NATIONAL PHONOGRAPH COMPANY,

By WM. E. GILMORE.

President.

HENRY M. RUSSELL,

Solicitor for Complainant.

FRANK L. DYER,

Of Counsel.



COUNTY OF ESSEX. }  
STATE OF NEW JERSEY, } ss:

WILLIAM E. GILMORE, being duly sworn, deposes and says, that he is the president of the National Phonograph Company, the complainant named in the foregoing bill of complaint; that he has read the said bill and knows the contents thereof; that the same is true to his own knowledge save as to the matters therein stated to be alleged on information and belief, and as to those matters he believes it to be true; that he verily believes Walter Henry Miller and Jonas Walter Aylsworth to be the first, original and joint inventors of the improved method of duplicating phonographic records set forth in said Letters Patent numbered 683,615, referred to in the said bill of complaint. 10

By WM. E. GILMORE,

20

Sworn to and subscribed before  
me this 30th day of June, 1905.

[SEAL] J. F. RANDOLPH,  
Notary Public of New Jersey.

UNITED STATES CIRCUIT COURT.

Southern District of West Virginia.

NATIONAL PHONOGRAPH COM-  
PANY,

vs.

AMERICAN GRAPHOPHONE COM-  
PANY.

In Equity,  
On Miller &  
Aylsworth Pat-  
ent, No. 683,615,  
(Process).

30

ANSWER

This defendant, now and at all times hereafter,  
saving and reserving unto itself any and all bene-  
fits and advantages of exception which can or may 40

be had or taken to the many errors, uncertainties and other imperfections in the said complainant's bill of complaint contained, answering thereto or to so much and such parts thereof as it is advised it is material or necessary to make answer unto, says:

10 That as to whether complainant is a corporation organized and existing under the laws of the State of New Jersey, with its principal place of business at West Orange, in said State, this defendant does not know and is not informed, save by the bill of complaint herein, and therefore calls upon complainant for proof thereof; but this defendant admits that it is a corporation organized and existing under the laws of the State of West Virginia.

I.

20 Defendant denies each and every allegation of paragraph 1 of the bill of complaint.

II.

Defendant admits that U. S. letters-patent No. 683,615 were issued to the National Phonograph Company on October 1, 1901, but on information and belief denies the other allegations of paragraph II. of the bill of complaint, defendant not being informed save by said bill.

30

III.

Not being informed save by the bill of complaint, defendant denies the allegations of paragraph III. thereof.

IV.

40 Not being informed save by the bill of complaint, defendant denies the allegations of paragraph IV. thereof.



V.

Defendant denies the allegations of paragraphs V. and VI. of the bill of complaint; and, more specifically, defendant denies that it has in any way infringed, or has prepared or intends to infringe, the letters-patent in suit, and further denies that it has committed any acts whatsoever which would encourage and induce others to infringe the same.

10

VI.

Defendant avers on information and belief that the said Jonas Walter Aylsworth and Walter Henry Miller were not the original, first and sole inventors or discoverers of the alleged invention or improvement set forth in U. S. letters-patent No. 683,615, or any substantial or material part thereof; that the same and each and every substantial part thereof were, long prior to the said alleged invention, set forth in the following letters-patent and publications, namely:

02

Letters-patent of the United States:

- No. 13,117, June 19, 1855, Otis;
- No. 33,884, Dec. 10, 1861, Gwynne;
- No. 37,898, Mar. 17, 1863, Bonanzo;
- No. 95,645, Oct. 12, 1869, Brunner;
- No. 108,306, Oct. 11, 1870, Van Haagen;
- No. 185,094, Dec. 5, 1876, Wilder;
- No. 255,449, Mar. 28, 1882, Pedrick;
- No. 281,529, July 17, 1883, Lefferts;
- No. 303,970, Aug. 26, 1884, Appelt;
- No. 326,049, Sept. 8, 1885, Muncaster;
- No. 327,160, Sept. 29, 1885, Hackman & Walter;
- No. 334,786, Jan. 26, 1886, La Bau;
- No. 359,637, Mar. 22, 1887, Schuberth;
- No. 368,851, Aug. 23, 1887, Phillion;
- No. 392,796, Nov. 13, 1888, Hadley;

30

40

- No. 400,649, Apr. 2, 1889, Edison;  
No. 408,998, Aug. 13, 1889, Tattershall;  
No. 414,761, Nov. 12, 1889, Edison;  
No. 437,429, Sept. 30, 1890, Edison;  
No. 445,932, Feb. 3, 1891, Murnane & Drosten;  
No. 466,728, Jan. 5, 1892, Smith;  
No. 484,582, Oct. 18, 1892, Edison;  
No. 493,191, Mar. 7, 1893, Smith;  
10 No. 525,116, Aug. 28, 1894, Richards.  
No. 528,273, Oct. 30, 1894, Lioret;  
No. 563,572, July 7, 1896, Day;  
No. 573,564, Dec. 22, 1896, Ziegler-Reinacher;  
No. 657,527, Sept. 11, 1900, Edison;  
No. 661,143, Nov. 6, 1900, Grasser;  
No. 662,857, Nov. 27, 1900, Hett;  
No. 662,858, Nov. 27, 1900, Hett;  
No. 666,493, Jan. 22, 1901, Capps;  
No. 666,720, Feb. 5, 1901, Edison;  
20 No. 666,819, Jan. 29, 1901, Reynard;  
No. 666,937, Jan. 29, 1901, Petit;  
No. 667,662, Feb. 5, 1901, Edison;  
No. 682,991, Sept. 17, 1901, Macdonald;  
No. 682,992, Sept. 17, 1901, Macdonald;  
Letters-patent of Great Britain:  
No. 1,478, of 1894, Young;

Publications as follows:

- Knight's Mechanical Dictionary, Volume 2, 1880,  
30 pages 1461-1462;  
Knight's Mechanical Dictionary, Volume 3, 1880,  
page 2169;

also many other letters-patent and publications as  
to the dates, numbers and description of which de-  
fendant is at present ignorant, but which it begs  
leave to disclose as soon as same shall have been  
ascertained and to amend this answer by inserting  
the same allegations concerning such other letters-  
40 patent and publications as are hereinbefore made



concerning those now known to this defendant as aforesaid.

VII.

This defendant avers, on information and belief, that the said Miller & Aylsworth were not the original, joint and first inventors or discoverers of the alleged invention or improvement set forth in said letters-patent No. 683,615, or any material or substantial part thereof, and further avers that the said alleged invention or improvement, and each and every substantial and material part thereof, were, long prior to the said alleged invention either known to or used by, or both known to and used by the following persons at the places hereinafter named, to wit:

Thomas A. Edison, of Llewellyn Park, New Jersey;

Place of use: Llewellyn Park, New Jersey;

Frank L. Capps, of Newark, New Jersey;

Place of use: Newark, New Jersey;

James K. Reynard, of Newark, New Jersey;

Place of use: Newark, New Jersey;

Ademore N. Petit, of Newark, New Jersey;

Place of use: Newark, New Jersey;

Thomas H. Macdonald, of Bridgeport, Connecticut;

Place of use: Bridgeport, Connecticut.

VIII.

This defendant avers, on information and belief, that the said letters-patent does not disclose or show any invention whatsoever in view of the state of the art of manufacturing sound records and analogous arts, as they existed at and long before the said Aylsworth & Miller made the alleged improvement set forth in said letters-patent; and that, in view of the said state of the art, said alleged im-

provement was not patentable, and involved, if anything, mere mechanical skill.

IX.

10 This defendant further answering says, that by reason of amendments, disclaimers, and arguments filed during the pendency of the application for said letters patent, said letters-patent in suit is, if valid at all, restricted and limited in scope to a process which is not now and has not been employed by defendant.

X.

20 Defendant avers, on information and belief, that for the purpose of deceiving the public the description and specification filed in the Patent Office in connection with the application for said letters-patent and now forming a part of the letters-patent itself, was made to contain less than the whole truth relative to the alleged invention or discovery, and that for this reason said letters-patent is null and void.

XI.

30 Defendant avers, on information and belief, that the process or alleged invention set forth in said letters-patent is inoperative and incapable of producing any useful result whatsoever.

XII.

Defendant avers on information and belief that the alleged invention of said letters-patent No. 683,615 was abandoned to the public prior to the grant of the patent.

40 Wherefore, and for the causes aforesaid, this defendant wholly denies the equity of complainant's bill herein, and all manner of wrongful and unlawful acts wherewith in the said bill of complaint it



is charged, and, further denies the right of the complainant to the relief, and each and every part thereof, alleged against this defendant in said bill of complaint, and submits it should not be compelled to make any other or further answer than that herein contained.

All of which matters and things this defendant is ready and willing to aver, maintain and prove as this Honorable Court shall direct; and said defendant prays the same benefits from this answer as if it had demurred to the said bill where a demurrer would have been proper, and pleaded to the said bill where a plea would have been proper, and humbly prays to be hence dismissed with its reasonable costs and charges in this behalf most wrongfully sustained.

AMERICAN GRAPHOPHONE COMPANY,  
BY E. D. EASTON,  
President.

ATTEST:

E. O. ROCKWOOD,  
Secretary.

(SEAL)

PHILIP MAURO,

C. A. L. MASSIE,

Of Counsel for Defendant.

STATE OF NEW YORK, }  
CITY OF NEW YORK. } ss.

EDWARD D. EASTON, being duly sworn, deposes and says, that he is of lawful age, is a resident of New York City, and is President of the American Graphophone Company, the defendant named in the bill of complaint herein; that he has read the foregoing answer subscribed by him as

President of the defendant company and knows the contents thereof; that the same is true of his own knowledge, except as to matters alleged to be stated on information and belief, and as to those letters he believes it to be true.

EDWARD D. EASTON,

Sworn to before me this 28th day of July, 1905.

10            [SEAL]   Elisha K. Camp,  
                 Notary Public, New York County.

UNITED STATES CIRCUIT COURT,

Southern District of West Virginia.

20	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>NATIONAL PHONOGRAPH COM- PANY,</p> <p style="text-align: center;"><i>vs.</i></p> <p>AMERICAN GRAPHOPHONE COM- PANY.</p> </div> <div style="width: 10%; text-align: center;"> <p><i>vs.</i></p> </div> <div style="width: 45%;"> <p>COM-</p> <p>COM-</p> </div> </div>	}	<p>In Equity, On Letters Pat- ent No. 683,615.</p>
----	---	---	--

### REPLICATION

The replication of the above-named complainant to the answer of the above-named respondent:

30            The repliant, saving and reserving unto itself now, and at all times hereafter, all and all manner of advantage of exception to the manifold insufficiencies of said answer, for replication thereunto, says that it will aver and prove its said bill to be true, certain and sufficient in the law to be answered unto, and that the said answer of the respondent is uncertain, untrue and insufficient to be replied unto by the repliant, without this, that any other matter or thing whatsoever, in the said answer contained, material and effectual in the law, to be re-

40            plied unto, confessed and avoided, traversed or de-



nied, is true; all which matters and things the re-  
pliant is now and will be ready to aver and prove  
as this Honorable Court shall direct and humbly  
prays as in and by its said bill it has already prayed.

Dated Wheeling, West Virginia, August 30,  
1905.

HENRY N. RUSSELL,  
Solicitor for Complainant.

10

UNITED STATES CIRCUIT COURT,

Southern District of West Virginia.

NATIONAL PHONOGRAPH COM-  
PANY,

vs.

AMERICAN GRAPHOPHONE COM-  
PANY.

In Equity,  
On Patent No.  
683,615, (*Pro-*  
*cess*).

20

Testimony taken on behalf of complainant pursu-  
ant to notice before John F. Randolph, Esq., a No-  
tary Public for the State of New Jersey and Special  
Examiner by consent, at the Edison Laboratory, Or-  
ange, New Jersey, this first day of November, 1905.  
Present:

FRANK L. DYER, Esq., for complainant.

30

PHILIP MAURO, Esq., for defendant.

Complainant's Counsel offers in evidence a cer-  
tified copy of Letters Patent No. 683,615, granted  
October 1, 1901, to complainant, as assignee of Wal-  
ter H. Miller and J. W. Aylsworth, and the same is  
marked "Complainant's Exhibit Patent in suit."

It is hereby stipulated and agreed by counsel that  
any testimony taken by either party in this cause,

40

and any paper exhibits introduced in connection therewith, may be used in the companion suit on apparatus patent No. 683,676, with the same force and effect as if regularly taken and introduced therein, and that in making up the record for the latter suit, any testimony or paper exhibits taken or introduced in this cause may be printed or re-produced as a part of such record. It is also stip-  
10       ulated and agreed that any model or apparatus ex-  
          hibits introduced by either side in this cause may be  
          used at the hearing of the companion suit with the  
          same force and effect as if regularly introduced  
          therein.

It is further agreed that printed copies of United States patents and blue-book copies of British pat-  
ents may be used by either side with the same force  
and effect as if regularly certified, subject, how-  
ever, to correction in case of error.

20       Counsel for defendant admits that complainant  
          is a New Jersey corporation, and was incorporated  
          January 27th, 1896, and has since continuously  
          maintained its corporate existence.

Counsel for defendant also admits that the entire  
title in the patent in suit is owned exclusively by  
complainant.

30       PETER WEBER, a witness produced on behalf  
          of complainant, being duly sworn, testified as fol-  
          lows:

Direct examination by Mr. DYER:

Q. 1. Please give your name, age, residence and  
occupation?

A. Peter Weber, age 45 years, residence 46  
Ridge street, Orange, New Jersey, and my occu-  
pation is Superintendent of the Edison Phonograph  
Works and other Edison companies.

40       Q. 2. Did you ever visit the factory of the Amer-  
          ican Graphophone Company, defendant herein, at



Bridgeport, Connecticut?

A. Yes, I did.

Q. 3. When?

A. The latter part of March or first part of April, 1905.

Q. 4. How did you happen to visit defendant's factory?

A. Upon the invitation of the Wile Power Gas Company—I think that is the proper name, to look over their gas producer apparatus which they were installing at the American Graphophone Company's plant at Bridgeport. I met a representative of the Wile Company by appointment at the Grand Central Station, New York; also Mr. King, Sales Manager of the Nash Gas Engine Company, who was also invited by the Wile Company to inspect this plant and see the working of the apparatus. On our arrival at Bridgeport, the man who installed the gas plant met us at the gate and showed us the apparatus which was located adjacent to the Power Station. As soon as the apparatus on the outside was explained, we went into the Wax Room, where a kettle was heated by a burner connected with this apparatus. As I remember, this Wax Room was on the third floor of the building, and on our way down we passed through the Record Molding Room, where I took notice of the method of molding records.

Q. 5. What kind of records were these?

A. Regular cylindrical sound records.

Q. 6. Did you see the actual manufacture of these records?

A. Yes.

Q. 7. Can you produce a drawing showing the apparatus which you saw in use in the Molding Room of the defendant company at the time of your visit, and employed in connection with the manufacture of cylindrical sound records?

A. Yes, I produce two drawings made under my directions sometime after my visit to defendant's plant. The first of these drawings is a plan view, showing the general layout as I remember it of one unit in defendant's factory, and the second drawing shows the tray with molds attached and a reaming knife, as I saw it used.

10       The drawings referred to are offered in evidence and marked "Complainant's Exhibit, Defendant's apparatus, Drawing No. 1" and "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 2."

Q. 8. Please take these two drawings which you have produced and describe in detail defendant's apparatus as examined by you at the time of your visit, and the process used by defendant in making sound records?

20       A. Referring first to drawing No. 1, A represents a kettle containing the record composition in the molten state and heated by gas. B are four trays, each of which carrying, I think, eight molds, from which the records are made. These molds were immersed below the surface of the molten material. C, C are two water tanks containing water for cooling the mold. D is a table on which the trays were placed after being lifted out of the water tank. E  
30       is a table on which the edging machine for trimming the ends of the record were located, and having a shelf F below it, over which cool air was blown from a perforated pipe G, so as to cool the mold sufficient to allow the records to contract away from the mold. H are the edging machines on the table E. I represents a tray having eight molds with records therein, being cooled by air from the pipe G.

40       Referring to drawing No. 2, J represents a tray having a handle K and carrying the molds L for



molding the record surface of the duplicate sound records. M is a spindle secured to the tray J and located centrally within each mold. This spindle acts as a guide for a reaming tool N for boring out the interior of the record and forming the concentric ribs therein. This boring tool was turned by a handle O and was provided with a pivoted knife P, operated by a small handle Q and adapted to be swung outwardly to engage the material of the composition after the tool was inserted over the spindle M. 10

The operation of making duplicate sound records in defendant's factory at the time of my visit was as follows:

One of the trays with the molds was introduced within the kettle A and the molds immersed beneath the surface of the molten material, which flowed over the top of the molds so as to fill them. 20 The tray and molds were thus immersed in the molten composition for several minutes. When the tray was removed another tray was introduced in the kettle so that there was always one or more trays continuously immersed in the molten composition. Upon removing the tray from the kettle A, it was put in the water tank C, and the water allowed to surround the molds, but not to overflow them. This resulted in chilling the material, so as to set it sufficiently to permit the boring operation to be performed. 30 The tray was then taken out of the water tank C and the boring tool N slipped over the spindle M of each mold. The knife P was then swung to its outer position (shown in drawing No. 2) and the boring tool rotated several times so as to ream out the bore of the duplicate record, the latter being still in the mold, and formed a series of concentric ribs on its interior. When all the duplicates in the mold of the tray had thus been reamed out on their bores, they were 40

passed over to the cooling and edging table and placed on the shelf F and subjected to a blast of air until the material was cooled sufficiently to result in the records shrinking away from the molds so as to permit them to be taken out. The records after being thus removed from the molds were successively placed on edging machines H, and their ends cut off smooth. This operation also defining  
10 the correct length of the record.

Q. 9. Did you ever have made an apparatus such as you saw in operation at defendant's factory?

A. Yes, I have had made an apparatus similar showing one mold and produce the same, together with the reaming tool.

The mold and reaming tool produced by the witness offered in evidence and marked "Complainant's Exhibit, Weber's Reproduction of Defendant's Mold," and "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool."  
20

Q. 10. I observe that a core is used which is seated on the spindle in the Exhibit Mold and that such a core is not shown in the drawings of defendant's apparatus produced by you. What is the object of this core, and did you see it in use with defendant's apparatus?

A. The object is to leave a space between the spindle and the composition for the introduction of the reaming tool. I did not see this core in defendant's apparatus, as I had no time to examine it in detail. In my opinion, however, there must have been a core, but I did not see it.  
30

Cross-examination by Mr. MAURO:

x-Q. 11. During your visit to the factory of the Graphophone Company did you converse with any  
40 of the employees of that company?



A. No.

x-Q. 12. Of whom did you ask questions in the Molding Room?

A. I did not ask any questions.

x-Q. 13. You said a while ago, if I am not mistaken, that you asked how long the tray of molds remained in the melted wax and were told, five minutes. Is that so?

A. I had taken out my watch when the gong sounded to find out how long the mold could be immersed in the wax composition, when the representative of the Gas Company asked me what I was timing. I told him I wanted to know how long the mold remained in the composition, and he told me, five minutes. 10

x-Q. 14. Did you inform any employee of the Graphophone Company that you were the Superintendent of the Edison Phonograph Works?

A. I had no opportunity, I did not come in contact with any of the employees or officers of the company. 20

x-Q. 15. How did you come to go into the molding room, who suggested your going in there?

A. I do not remember anybody suggesting it; as I remember I simply followed the representative of the Gas Company through the room.

x-Q. 16. Your recollection is that in order to get to the room where the gas burner was, you had to pass through the molding room? Is that it? 30

A. Yes, as I remember we entered the room through the yard and walked through it and went up a stairway to the upper floor.

x-Q. 17. In your direct examination, you stated that "on our way down we passed through the record molding room." Do you now wish to say that you went through the molding room, both going and coming?

A. Yes. 40

x-Q. 18. How long, altogether, were you in the molding room?

A. I stopped at one end possibly two or three minutes, and what made me stop was that some gentlemen, apparently the superintendent or foreman of the works, stopped the Gas Company's representative to talk with him. I passed on a few steps and waited for them.

10 x-Q. 19. How long after that visit did you make a drawing to show your recollection of what you observed there?

A. I believe within a week or two I made just a rough sketch and gave explanations here to our man to make the sample mold. (Witness refers to "Complainant's Exhibit, Weber's reproduction of Defendant's Mold" and "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool.")

20 x-Q. 20. Did that rough sketch show substantially what is shown by the blue-print drawing you have described today?

A. Yes.

x-Q. 21. At whose request was that drawing made?

A. By no one's request; I wanted to see for my own satisfaction how this molding scheme worked.

30 x-Q. 22. To whom first and when did you describe your observations in the molding room of the American Graphophone Company?

A. It may have been Mr. Aiken, my assistant; but I know I told Mr. Edison within a day or two after my visit.

x-Q. 23. Did Mr. Edison know of your proposed visit?

A. No, he did not know.

40 x-Q. 24. You have spoken of a reaming operation which you observed in the molding room of the Graphophone Company; was there anything



about that operation different from ordinary reaming operations with which you are familiar?

A. Yes, in that the reaming was done by hand.

x-Q. 25. When the mold was in the wax composition in the tank, were both sides of the mold in contact with melted wax?

A. That, I did not see; I was not near enough to the kettle.

x-Q. 26. Did the mold have any means for preventing contact of the outside with the melted wax? 10

A. After the molds came out of the water tanks I saw them, but did not see them before.

x-Q. 27. In your answer to Q. 8, you said, "these molds were immersed below the surface of the molten material"; do you wish now to say that you did not see that?

A. I did not see them, but I think they were; as I felt underneath the mold they had a solid bottom, so that no wax could enter underneath them, and the wax must have entered from the top. 20

x-Q. 28. Can you not also infer that the outside of the mold must have been in contact with the melted composition during the time the mold was immersed therein?

A. From the experience I have had in the manufacture of records I would infer that the composition would have to be in contact with the outside of the mold, in order to bring it up to or near the temperature of the composition. 30

x-Q. 29. Do you know what that temperature was, or about what it was?

A. No, I do not recollect, but I asked that question of the Gas Company's representative after we had left the room, and I know from his answer that the temperature was considerably above 300 degrees F.

x-Q. 30. You understand that it was considerably above the melting point of the composition? 40

A. Yes, the reason I remember that it was above 300 was because 300 was above the temperature that we use, and it was above that.

x-Q. 31. The temperature that you use is such that after the mold is immersed in the composition the latter congeals on the inner surface of the mold. Is that correct?

A. Yes.

10 x-Q. 32. In the operation that you saw at the Graphophone factory, did the material congeal on the surface of the mold or was it in a fluid state in the mold when the latter was taken out of the kettle?

A. I did not see it at that time; I saw it after it came out of the water.

x-Q. 23. I suppose you would say, as a matter of inference, that it must have been fluid, would you not?

20 A. Yes.

Re-direct examination by Mr. DYER:

Rd-Q. 34. You spoke of the reaming operation which was performed on defendant's record while the latter were still in the mold and before the cold air treatment to separate the record from the mold. In performing reaming operations on cast articles in general, for instance, an iron casting, is it the custom to ream the articles while in the molds or after they have been taken out of the molds?

30 A. We have always reamed them while in the mold.

Rd-Q. 35. Do you now refer to complainant's sound records?

A. Yes.

40 Rd-Q. 36. You did not exactly understand the question. Leaving out of consideration the manufacture of sound records, I ask if in other arts, for instance in finishing a cast steam engine cylinder, or any other cast article, it is the custom generally



*Stipulation.*

25

to ream out the article while still in the mold or after the article has been taken out of the mold?

A. Invariably; I have never heard of any instance but that a casting is reamed after it is taken out of the mold.

Signature and certificate waived.

IN THE UNITED STATES CIRCUIT COURT.

10

For the Southern District of West Virginia.

NATIONAL PHONOGRAPH COMPANY,

*Complainant,*

*vs.*

AMERICAN GRAPHOPHONE COMPANY,

*Defendant.*

In Equity. On  
Letters Patent  
No. 683,615.

20

Testimony taken on behalf of complainant, pursuant to notice, before Edwin S. Clarkson, Esquire, Notary Public in and for the District of Columbia, as Special Examiner by consent, at the offices of Bacon & Milans, No. 908 G Street, Northwest, Washington, D. C., commencing the 22nd day of December, 1905.

Present:

30

MR. FRANK L. DYER, for complainant.

MR. PHILIP MAURO, for defendant.

It is hereby admitted by counsel for defendant that subsequent to the first day of October, 1901, and prior to the filing of the bill of complaint herein, the defendant, at its factory in Bridgeport, Connecticut, made use of devices or apparatus for duplicating phonograph records, substantially like

40

those described in the deposition of Peter Weber, taken on behalf of complainant herein and shown in "Complainant's Exhibit, Defendant's apparatus, Drawing No. 1," "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 2," "Complainant's Exhibit, Weber's Reproduction of Defendant's Mold," and "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool."

10 That in operating with such devices or apparatus within the time stated, the defendant proceeded as follows:

20 The material used by defendant in the manufacture of its duplicate records was a wax-like material or composition. This composition was maintained in the wax kettle at a temperature of about 350 degrees F. A tray containing eight molds, each carrying the negative representation of a sound record on its bore, was now immersed below the surface of the molten composition, so that the composition flowed into the molds over the tops thereof, filling the space between each mold and its core. This immersion was continued for about five minutes. The tray was then removed from the wax kettle, carrying the molds filled with the composition in a molten state, and the molds were then immersed in cold water, so as to chill the material to a temperature of about 150 degrees F. At this  
30 temperature the material, while still tightly engaging the mold, was relatively soft and plastic. The core was then removed from each mold, leaving a layer of congealed material adhering to the bore and the reaming tool was then introduced so as to remove the surplus material and to form a plurality of concentric ribs on the interior of the duplicate record, said ribs being of gradually increasing depth. The molds were then subjected to a blast of cold air, so as to further reduce the temperature of the duplicate records. In consequence of the  
40



cooling of the records, a diametric contraction thereof takes place so as to permit their withdrawal from the mold. The molds were in some cases provided with detachable bottom plates screwed thereto, said plates bearing raised characters constituting a descriptive title of the record, so that an impression of the characters on said plate was made in the end of the record during the process of molding the latter. After the records had been removed from the molds, the material was cut off at the unfinished end, so as to result in the production of a record of the desired length, and the records were then finished for the market.

10

L. SEWARD BACON, a witness produced on behalf of complainant, being first duly sworn, testifies as follows:

Direct examination by Mr. DYER:

Q. 1. What is your name, age, residence and occupation?

20

A. L. Seward Bacon; 45; Washington, D. C.; solicitor and expert in patent matters and causes. I am also an attorney at law.

Q. 2. What experience have you had which would tend to qualify you as an expert in a suit involving as its subject-matter the question of infringement and the interpretation or meaning of United States Letters Patent?

A. I have been engaged in my present profession for the past fifteen years, during which time I have frequently been called on to testify as an expert in patent causes pending before the United States courts. During my experience as a solicitor of patents I have prosecuted a great many applications for patents, have been constantly required to investigate inventions, patents and publications dealing with the useful arts, and in considering such matters have necessarily been required to ascertain, determine and point out differences be-

30

40

tween mechanical structures, methods of operation or processes, compositions, and articles of manufacture. I have frequently been called on to explain with definite exactness mechanical structures; and to point out concisely and specifically functional and mechanical advantages possessed by structures, methods, etc., over the prior state of the art. In fact, I may say that for fifteen years  
10 past I have been constantly employed in the matter of expert considerations of inventions, and in comparing inventions with other inventions of the prior art. During my experience I have very often been called on to express my opinion as to the meaning of language employed in United States patents, and as to the definition of inventions or supposed inventions described in specifications of patents. I have also often been called on to express my opinion as to the question of infringement by structures,  
20 methods, etc., of claims of United States letters patent, pointing out similarities and as far as possible the relative differences between inventions defined and other or analogous inventions in methods, etc.

Q. 3. Have you read and do you understand the method disclosed and set out in United States letters patent No. 683,615, issued to Walter Henry Miller and Jonas Walter Aylsworth, assignors to the National Phonograph Company, dated October  
30 1st, 1901, for "Method of Duplicating Phonograph Records"? If so, please explain your understanding of the invention therein disclosed; and in considering this matter and giving your explanation also address yourself to the consideration of claims 3, 4 and 5 of the said patent, stating your understanding of the meaning of the said claims and the invention covered or intended to be defined therein.

A. I have and do. The patent which I have  
40 been referred to consists, as the title implies, in a



"Method of Duplicating Phonograph Records," and the inventors state that the invention "relates to an improved process of duplicating phonographic records." From the specification of this patent it appears clearly that the primary object and aim of the inventors was, as stated in their language, "to provide a process by which the duplicating of phonographic records can be carried on expeditiously and economically and duplicate records produced which are of superior quality." In my judgment, the patentees have addressed themselves particularly to the expeditious and economical production of duplicate records, and in addition to this they have had in view the production of a duplicate record of a superior quality; that is, superior to those which had been made by the former practices.

It is hardly necessary for me to state the obvious fact that in dealing with a duplicate phonograph record one is dealing with a very delicate and practically microscopical problem; namely, the exact copying of the extremely minute and highly differentiated surface variations, corresponding to sound waves originally recorded on a blank cylinder to thereby form a "master record." The fact will be clearly apparent, when one considers that in duplicating a phonographic record so as to preserve all the characteristics of the original record, a method to be adopted should necessarily be addressed to the peculiar characteristics of the minute reproductions to be made. In duplicate phonograph records (which are, and as I understand it, have been, made of a wax-like material), the impression or record surface should have all of the peculiar vibratory undulations, minute depressions and varying curves which will result in the proper actuation of the diaphragm of the reproducing machine, so that the reproduced sounds will be as near as possible

in exact accordance with the original sounds as recorded on the first, original, or "master" record. Such being the case, naturally in considering a method of duplicating original records many important considerations and conditions are required to be taken note of, and the method of operation in the art of duplicating must be governed accordingly. I find in this patent a description of a method designed particularly to handle the delicate proposition of duplication, and so in an expeditious and economical manner, and with a result that a superior finished article is produced.

Referring now to the specification of the patent in suit, I find that the inventors have prefaced their statement and description of their invention by referring to the fact that they "first secure a matrix or mold from which copies are to be produced." They then suggest that said matrix or mold can be made by any suitable or approved process; referring specifically thereafter to a process of producing the matrix or mold by electroplating on a vacuous deposit preliminarily secured upon an original phonographic cylinder. This special method of making the matrix or mold is described in United States letters patent of Thomas A. Edison, numbered 713,209, dated November 11, 1902, the application for which was filed March 5, 1898, and which relates to a "Process of Duplicating Phonograms." I quote:

"In carrying my process into effect I first construct a matrix carrying a negative representation of the record, which matrix can be produced by any of the known processes—as, for example, those indicated in my Patent No. 484,582, dated October 18, 1892. As I explained in this patent, an original phonographic record having a surface of the usual wax-like material is first secured and its sur-



face coated with a coating of conducting material in order to permit the original record to be electroplated. This conducting coating can be and preferably is applied by a process of vacuous deposit, as I described in my Patent No. 527,147, dated September 18, 1894, by placing the record in a vacuum-chamber in which a metal is vaporized by an electric arc produced between electrodes of the metal, the metallic vapor depositing as a thin uniform coating on the original record. I prefer to apply a preliminary coating by a process of vacuous deposit, for the reason that the highly-comminuted condition of the vaporized metal permits the coating to form as a uniform film, following accurately all the variations of the record, however minute. Instead of coating the original record with a vaporized metal it may be coated with a very thin layer of specially prepared plumbago of exceedingly great fineness, or instead thereof gold-leaf or silver salts reduced by chemical reagents to the metallic state may be used for the same purpose. Having thus applied a very thin preliminary coating to the original record, the latter is immersed in an electro-plating bath and electroplated with a metal to the desired thickness, thereby forming a shell inclosing the original record, which shell carries on its bore an accurate negative representation of that record. Preferably this shell is suitably incased in a close-fitting cylindrical jacket, although if the electroplating is carried on long enough to form an electroplated coating of sufficient thickness a jacket need not be used. The original record is removed from the electroplated matrix obtained as described, either before or after the jacket, if used, is applied to the shell."

From this quotation it will be observed that the Edison method of producing the matrix or mold is such as to produce a metallic mold in the form of a cylinder carrying on its bore a representation in negative or relief of the original record. After the original wax-like cylinder or cylinder carrying the original record (the so-called "master record") has been coated with a suitable metal as referred to by Mr. Edison, to form an excessively thin conducting film, it is electroplated so as to thereby form a metallic shell; after which the shell is conveniently encased in a closely fitted metallic jacket. The method of securing a metallic deposit upon the original record, in other words the "vacuous deposit" referred to specifically in the patent in suit, is more fully described in the Edison patent No. 713,863, of November 18, 1902.

The mold or matrix being in a continuous cylindrical form and carrying on its inner face or wall of its bore an exact representation in negative or relief of the original record, is, according to the patent in suit, first immersed in a heated body of molten wax-like coagulable material, so that its record carrying surface will be entirely immersed in the said wax-like material. Referring to this material the patentees state that it "may be the ordinary commercial phonographic composition now in use." After the record or matrix has been immersed, the material in contact therewith and adjacent to the record bearing surface is cooled to such an extent that the wax-like substance congeals, or has become coagulated or chilled on the interior of the matrix and is deposited thereon so as to fill all of the depressions in the matrix or mold and to form a complete coating thereon of the required thickness. After the wax-like material has congealed sufficiently and has assumed a substantially coagulated and solidified character,



though still plastic or somewhat soft in its nature, the mold with the wax-like material adhering to the inner wall thereof is then removed from the molten mass and the interior or bore is finished before the layer of deposited wax-like material has become hard. This finishing as described in the patent, consists in reaming or cutting out the superfluous material from the center of the loaded mold and so while it is in the plastic state, and furthermore, this reaming out or finishing of the interior of the cylinder, is accomplished and carried out while the wax-like duplicate record is still held tightly in the mold, the mold in that respect serving as a chuck to securely hold, without the possibility of disfigurement, the otherwise delicate and easily disfigured cylinder of wax-like material.

In carrying out their method, the inventors have suggested an apparatus suitable for that purpose and have illustrated it as well as described it. I do not understand, however, that the method as such is in any respect limited to the use of the particular apparatus. The inventors state that "we may utilize any suitable apparatus for the purpose," and that "The apparatus illustrated in the accompanying drawings which form a part of this specification is merely an illustrative one and we do not wish to be limited thereto." The apparatus illustrated and described is helpful, however, in ascertaining the general principle and purpose of the method or process disclosed in the patent. Their suggested apparatus consists of a receptacle having an opening in the bottom, and in this receptacle is placed a mold which is indicated at 1, Figure 1. This mold is held in place within the receptacle and is supported on a plate or disk having an opening therein. The top of the mold is provided with a cap which, as stated in the patent, is for the purpose of preventing the molten wax-like material

10

20

30

40

from flowing over the edge of the mold. After the mold has been placed in the receptacle, the receptacle is plunged into the tank 11 containing the heated, molten, wax-like material. The material will immediately flow up through the opening in the bottom of the mold and completely immerse the record surface of the mold. It will be noticed that the material is not permitted to come in contact with the outer face of the mold, which is otherwise exposed to the atmosphere. During the period of immersion of the record bearing surface in the heated wax-like material, the material is permitted to remain in contact with the record bearing surface until the wax-like material congeals, owing to the difference in temperature between the mold and the material. The congealing of the material is allowed to continue until a sufficient amount has collected and coagulated in the mold to constitute the body of a cylinder. The mold is then removed and the reaming tool, as shown in Figure 2, is inserted, the mold itself serving as a chuck for holding the wax-like material and permitting the cutting tool or reamer to shave off or cut the material, and so while it is still in a plastic or soft, but solid condition, thus reducing the cylinder to the proper size or thickness. A peculiar reaming tool is used and referred to, the same being so fashioned as to leave concentric ribs of varying thickness at different points along the interior of the cylinder. These ribs are designed to engage the mandrel of the phonograph, and their varying thickness form in substance a tapered bore for the proper positioning and easy removal of the cylinder from the machine mandrel. In this respect I understand that the patentees have produced an improved record, having a shell of substantially uniform thickness, and a series of concentric ribs of gradually increasing depth. After the cylinder has been finished, it



is subjected to the action of a cooling fluid for a period sufficiently long to shrink the cylinder, diametrically and uniformly, slightly away from the mold, and it is then drawn out from the mold. This diametric contraction of the finished record is a phenomenon that exists entirely independent of the setting, congealing, coagulating or solidifying of the material, and takes place only when the set or solidified material is subjected to a further reduction in temperature. It will be seen that a record thus produced is, so far as its characteristics record-surface is concerned, an exact copy of the original in every microscopic particular. It will also be seen that the operation is very simple, and can be carried on manifestly very economically and expeditiously, and with simple apparatus and without skilled labor. It is manifest that by the process adopted by these patentees, the minimum amount of material is used in the duplicate cylinder, while the maximum strength is preserved; and, further, that an accurate and perfect reproduction is made without joints or seam. The work of reaming or finishing is carried on at a time when the material is in the best condition for such purpose; that is, mainly in a soft and plastic state which will yield readily and smoothly to the action of the reamer or knife.

I find that claims 3, 4 and 5 are all directed to the method which is stated to be the subject-matter of the invention, and in discussing these claims I shall take them up in their order.

Claim 3 reads as follows:

"The method of duplicating phonographic records, which consists in immersing a mold or matrix carrying the record in relief on its bore in a molten, wax-like, coagulable material, whereby the material will accumulate on the

bore of the matrix or mold and chill thereon in a layer of the desired thickness, in finishing the bore of the duplicate so secured, and in separating the duplicate from the matrix or mold, substantially as set forth."

10 Analyzing this claim in view of the stated invention referred to in the specification or description, I find that the method set forth in said claim consist in the following steps: First, in immersing the mold or matrix in molten, wax-like, coagulable material; Second, in chilling the material or cooling the same, whereby the wax-like coagulable material will accumulate on the wall of the bore of the mold or matrix in a layer of the desired thickness to properly constitute a cylinder; Third, in finishing the bore of the cylinder while it is in the mold or matrix; and, finally, in separating the cylinder, or duplicate as it is stated to be, from the matrix or  
20 mold. The method thus described or defined in this claim clearly comprehends the four steps which I have referred to.

The fourth claim of the patent is stated in the following language:

30 "The method of duplicating phonographic records, which consists in immersing a mold or matrix carrying the record in relief on its bore in a molten, wax-like, coagulable material, whereby the material will accumulate on the bore of the matrix or mold and chill thereon in a layer of the desired thickness, in finishing the bore of the duplicate so secured, and in shrinking the duplicate form the matrix or mold, substantially as set forth."

and defines the invention with slightly more pronounced specific detail. It consists in a method comprising the following steps: First, in immersing the mold or matrix in the molten, wax-like coagulable material; Second, in cooling the material or  
40 chilling the same whereby the same accumulates on



the bore of the mold or matrix in a layer of the desired thickness; Third, in finishing the bore of the duplicate so secured and while in the mold; and, Fourth, in shrinking the duplicate from the matrix. This claim differs from the third in that the third claim is sufficiently comprehensive to include the separation of the cylinder or duplicate from the matrix or mold by means other than that of shrinking or contracting the duplicate. Otherwise the claims are, in substance, the same. 10

The fifth claim is stated in the following language:

"The method of duplicating phonographic records, which consists in immersing a mold or matrix carrying the record in relief on its bore in a molten, wax-like coagulable material, whereby the material will accumulate on the bore of the matrix or mold and chill thereon in a layer of the desired thickness, in finishing the bore of the duplicate so secured before the latter has become hard, and in separating the duplicate from the matrix or mold, substantially as set forth." 20

and defines a method embodying the following steps: First, the step of immersing the mold or matrix in the molten, wax-like coagulable material; Second, cooling or chilling the material whereby the same may accumulate on the walls of the bore of the mold in a layer of the desired thickness; Third, in finishing the bore of the cylinder or duplicate while secured in the mold and before the wax-like material has hardened; and, finally, in separating the duplicate from the matrix or mold. This fifth claim defines the invention with greater detail than the other two claims, in that it directly refers to that period of time in which the finishing of the bore of the cylinder is effected as being "before the latter has become hard." 30 40

10 In considering this patent, which is for a method as distinguished from an apparatus, naturally I have directed my investigation and consideration to the steps of the method, irrespective of constructions of apparatus, which latter as I understand it is made the basis of the companion suit between the same parties. While an apparatus is illustrated for the purposes of explaining the method invented, yet manifestly the consideration of the art or method is wholly independent of the apparatus. As I understand the patent, the inventors have emphasized the fact that other apparatus of course could be used, and have also suggested that the method can be modified or varied without departing from the inventive idea. That being the case, I am of the opinion that, in the claims to which my attention has been directed, the inventors have defined a method of producing duplicate phonographic records in a manner substantially as stated in the description, as well as in a manner substantially similar to that of the description, provided the results and the various steps are substantial equivalents of those set forth in the patent.

20  
30 Q. 4. Have you read the testimony of Peter Weber in this case, have you examined the exhibits referred to by him and have you read the admission of defendant's counsel entered on the record relating to the manner of making duplicate phonograph record produced by defendant?

A. I have.

Q. 5. Do you understand the method employed by the defendants herein and described by Mr. Weber, and as admitted by defendant's counsel?

A. I do.

40 Q. 6. Please compare the method of duplicating phonograph records described by Mr. Weber in his deposition, and as shown in said exhibits and as



admitted by defendant's counsel, with the invention disclosed in the patent in suit, and especially as defined in claims 3, 4 and 5; and state whether or not in your opinion the said method employed by the defendant embodies the invention defined in the said claims.

A. Taking up the defendant's method, I find that their first step, after a matrix or mold has been produced from the original record, is that the mold or matrix is plunged into a bath of wax-like coagulable material, thus immersing the record bearing surface of the same in the wax-like material while the latter is in a heated and molten state. The material contained within the mold or matrix being in contact with the record carrying surface thereof is then chilled or cooled until a layer of the desired thickness thereof has accumulated within the mold, and thereafter a reaming tool is inserted in the mold and the superfluous wax-like material is removed by the reaming tool. This act of finishing is carried on while the wax-like material is in a plastic and soft state; that is to say, previous to its having become hard and brittle. After the finishing step has been accomplished, the cylinder is thereafter removed from the mold by shrinking; that is, the mold is subjected to the action of a cooling blast of air, for a period of time sufficient to cause the wax-like material to shrink sufficiently to permit its removal from the mold. As I understand the defendant's method is in every particular the same as the complainant's patented method, in the order of steps, purposes and result. I notice, however, that in the specific example of complainant's method described in the patent in suit, the cooling act is carried on while the mold itself, together with its carrier or receptacle, is in the kettle containing the heated wax-like material; while in the defendant's method the mold with its

10

20

30

40

charge of heated wax is removed from the kettle, and the cooling or chilling step is effected or carried out thereafter; and that to properly confine the charge of molten material in defendant's mold, a core is used, but is removed, after the material has set or congealed and before the reaming of the record is effected. However, it is very clear that the objective point, of maintaining the wax-like material in contact with the mold *per se*; that is, in contact with the molding surface, during the chilling operation, is the same in both cases, the purpose being to permit the accumulation of the congealed material on the inner surface of the mold. It is true that in the apparatus employed there are some differences, which it is unnecessary for me to refer to inasmuch as the apparatus as such is unimportant in connection with a comparison of the two methods, as to steps and procedure. One difference in apparatus, however, which might be noted is this: That whereas with the specific example of apparatus described in the patent the mold carrying the congealed layer of material is rotated with respect to a stationary reaming or ribforming tool in defendant's apparatus the tool is rotated with respect to the stationary mold; but this is a mere reversal of operations, performing the same function in substantially the same way, and defendant's operation is in my opinion clearly the equivalent of the corresponding operation of the patent. Slight differences in the specific details of the two methods might also be pointed out, but which do not, in my opinion, alter in any way the substantial identity of the two methods. Thus, in the method as described in the patent, the material is allowed to enter the mold from below, while in defendant's method the material enters the mold from above; with the former the cooling of the material to set or congeal the same is effected



by surrounding the mold with *air*, while in defendant's method the same operation is performed by surrounding the mold with *water*; and in the former the final cooling of the finished duplicate to contract the same clear of the mold, is effected by surrounding the mold with a *water* jacket; while in defendant's method the same operation is performed by subjecting the mold to the effect of an air blast. But these are, in my opinion, clearly equivalent operations, designed for the accomplishment of similar results, and performing their functions in substantially the same way. 10

Comparing claim 3 with the defendant's method as I understand it, I find that in defendant's method the following steps are performed: First, the mold carrying the record in negative or relief thereon is immersed in the molten, wax-like coagulable material; Second, following such immersion, while the said material is in contact with the record surface of the mold, the said material is cooled or chilled, whereby the material accumulates thereon and such accumulation is permitted to continue until the desired thickness of the material is acquired; Third, the material contained within the mold is then acted on so that the bore of the duplicate or cylinder composed of the congealed wax-like material is properly finished; and, finally, the step of separating the duplicate from the mold is then carried out. Such being my understanding of the situation, I am of the opinion that the method of producing duplicate phonograph records practiced by the defendant is the same as the invention defined by the third claim. 20 30

Referring now to claim 4; what I have said in relation to claim 3 clearly applies to claim 4, including the specific limitation of shrinking the duplicate from the mold, that being the final step re- 40

cited in claim 4 of the patent and used by the defendant.

Referring now to claim 5 of the patent, I find that the defendant's method of procedure responds exactly to this claim, in the same particulars and in the same order as that explained in connection with claims 3 and 4; and that, also, the defendant employs and practices that step which is referred to in the said claim 5 as consisting in "finishing the bore of the duplicate so secured before the latter has become hard." In fact, in the admission of defendant's counsel to which you call my attention it is distinctly stated that when the reaming or finishing operation with defendant's method took place "the material, while still tightly engaging the mold, was relatively soft and plastic."

Making a general answer to your question, therefore, I am of the opinion that the method practiced by defendant is the method, or at least an equivalent method of the patent in suit as defined in the third, fourth and fifth claims thereof; that the several steps in the method of the patent in suit are substantially employed in defendant's method; that the several steps of the two methods are employed for the same purpose and in the same sequence; and that by the process of defendant's method the particular kind of duplicate records described by the patent in suit will be obtained; namely, a duplicate record having a molded record surface, with a shell of substantially uniform thickness and with a series of concentric ribs of gradually increasing depth. In fact, I am familiar with the commercial duplicate records made by complainant and defendant, and they are so nearly alike as to be practically indistinguishable, except for the distinctive markings on each, showing its origin. Whatever differences may exist between defendant's method and that disclosed by the pat-



ent in suit are, in my opinion, merely colorable, and do not in any way affect the identity of the two methods in procedure, objects and results.

Complainant's counsel offers in evidence copies of Edison patents, No. 713,209 and No. 713,863, referred to by the witness, and the same are marked "Complainant's Exhibit Edison Mold patent" and "Complainant's Exhibit Edison vacuous deposit patent," respectively.

10

Met pursuant to adjournment this 29th day of October, 1906, at the offices of Bacon & Milans, 908 G Street, N. W., Washington, D. C.

Parties present as before.

Cross-examination of Mr. Bacon by Mr. MAURO:

x-Q. 7. Prior to giving your deposition in this suit, what experience, if any, have you had as an expert in suits involving patents in the art of recording and reproducing sounds?

20

A. I have had some considerable experience in this art, but I do not now recall of having been called on to testify in any suit prior to this suit wherein the subject matter related to this particular class of inventions.

x-Q. 8. What practical knowledge have you of methods now in vogue for making copies of sound records by casting in a mold, and how was that knowledge acquired?

30

A. My direct examination in this case was conducted about a year ago, prior to which time I had occasion to examine carefully the method employed by the National Phonograph Company at West Orange, N. J. Since that time I have not had occasion to visit the factory nor have I ascertained the methods adopted by either the defendant or the complainant at the present time but presume that the methods are the same, or substantially the

40

same, as when I gave my direct testimony.

x-Q. 9. Did the inspection of complainant's process qualify you to compare the process of the patent in suit with other processes and to form an opinion as to the relative economy and expedition thereof or as to the relative excellence of the products?

10 A. My inspection of complainant's factory and observations as to their method and process undoubtedly assisted me somewhat in forming a comparative opinion, in that I had occasion to watch the expeditious manner in which the hundreds of apparently unskilled operators were performing the method and producing the product. It also impressed on my mind after inspecting the product that the method so rapidly operated or carried on by such a multitude of operators so uniformly produced a product which was seemingly perfect. In  
20 this connection I would state that I examined the cylinders very carefully after they were produced; saw them being tested and while of course I did not see them all I was astonished at the relatively small number which were discarded after tests.

x-Q. 10. With what other factory method and product, if any, did you compare those of complainant?

30 A. With the factory method and product of the defendant. I desire to say here, however, that I did not visit the defendant's factory, but as my testimony will show comparison was made by reference to the testimony of the witness Weber and the exhibits referred to by him.

x-Q. 11. Did you testify in this case under the supposition that the method of the patent in suit was the first method devised for casting sound records in a mold?

40 A. In my last answer I neglected to state that I had also referred and considered the stipulation



entered into by counsel relative to the method adopted by defendant. Answering your question: I did not take this matter into consideration as my investigations had been confined to the subject matter inquired about in the questions propounded to me in my direct examination.

x-Q. 12. You refer in your direct testimony to the minute impressions of a sound record in which it is necessary to copy faithfully in order to have a satisfactory duplicate, and then state that you "find in this patent a description of a method designed particularly to handle the delicate proposition of duplication." What feature or features of the invention in suit are addressed to that delicate proposition, and state particularly if you mean any more than that the melted material is cast in the mold, and so takes an impression of the surface thereof? 10

A. In reference to this matter I had naturally directed my attention to the method adopted and stated in the patent and I understand the method is addressed to the production of duplicated phonographic records having the characteristics of the original or master record and I do not think it commences and ends with any particular single step of the method. 20

x-Q. 13. This patent does not purport to describe a new mold or method of making it, does it? 30

A. The patent in suit does not as I understand it relate to the method of producing a mold at it states in "carrying our invention into effect we first secure a matrix or mold from which copies are to be produced, said matrix or mold being made by any suitable and approved process."

x-Q. 14. Neither does it describe any new sound record material, does it?

A. If you are referring to the composition used in forming the record cylinder, I should say that 40

the patent did not relate to any specific material.

x-Q. 15. The patent relates exclusively to a method for making an old material to take an impression from an old mold, is not that an accurate statement?

10 A. I do not think so. The patent relates to a method of duplicating phonographic records and while it may be that in the method adopted a material is employed which is not a part of the invention defined in the patent, or that a mold or matrix is employed which is in itself specifically not a part of the patent, yet that does not in my opinion vary the plain fact that the invention relates to a method of producing phonographic records and so even if the mold itself were old or the material or composition is old and were employed in connection with the performance of the method.

20 x-Q. 16. In the method of this patent, what is it that causes the sound record material to take a faithful impression of the surface of the mold?

A. The contact with the surface of the mold.

x-Q. 17. Is that what produces a like result imprevious methods of casting sound records and other articles?

30 A. I do not understand that the question refers to any previous methods adopted in this particular art, if so, I have not prepared myself for testifying as to the prior art in this particular class, but if the question is directed to the general proposition of molding, irrespective of the art, I should answer the same in the affirmative.

x-Q. 18. You have referred to and quoted at length from a prior Edison patent which is specifically for a process of duplicating phonograms by molding, so I assume that you are at least to that extent acquainted with the prior art, are you not?

40 A. By my quotation from the patent No. 713,-



209 was more with a view of advising the Court as to the special method referred to in making the matrix or mold, and the quoted part of the specification of that patent relates to that feature, that is as far as I have made use of the patent. Patent No. 713,209 of November 11, 1902. To that extent I am somewhat familiar with that patent.

x-Q. 19. What I want to get at is, what if anything there is peculiar to the method of the patent in suit whereby faithful copies of sound records are obtained. If there be any such peculiarity of the method in suit, please point it out. 10

A. The peculiarity of the method in suit resulting in the production of the cylinders is the general subject matter of the entire patent and consists in the various steps essential to the performance of the method. It does, not in my judgement, relate to any one particular step but to the various steps necessary for the performance of the method. 20

x-Q. 20. What is the gist or salient feature of the methods of this patent which distinguishes it from other methods of casting sound records?

A. I would simply state that the method defined in this patent is addressed to the duplicating of phonographic records and I do not find that the patent refers to anything in the prior art relative to molded sound records but it refers incidentally to mechanical duplication or mechanical duplicating process. I think the method set forth in the patent is well defined in the three claims which I have been referred to and in that respect, seemingly, the method as such should be regarded as one wherein the series of sets are required to be performed and it does not seem to me that the claims can be segregated into different features or steps, but should be considered as a whole. 30 40

I should therefore regard one feature or step of the method of the patent equally as salient as the others in view of the fact that the invention is a method which consists of a series of steps.

10 x-Q. 21. The first thing the Court will want to know about this case will be, what is the gist or salient feature or features of the invention. You have offered yourself as a duly qualified expert in this art and I ask you again if this invention has not some peculiar characteristic feature as a method of casting sound records which distinguishes it from other antecedent methods of casting sound records.

A. In answering your question I shall quote the second paragraph of the patent in suit:

20 "Our invention relates to an improved process of duplicating phonographic records; and our object is to provide a process by which the duplicating of phonographic records can be carried on expeditiously and economically and duplicate records produced which are of superior quality."

30 The inventors then proceed to describe their method in detail step by step and finally define their method in the three claims which I have been questioned about, the third claim which is the first inquired about defining the inventions as 'a method which consists in first immersing a mold or matrix carrying the record in relief on its bore in a molten wax-like coagulable material; second, causing the material to accumulate on the bore of the matrix or mold and chill thereon in a layer of the desired thickness; third, finishing the bore of the duplicate so secured and finally separating the duplicate from the matrix. As I view the situation, these steps are related and are expressive of the method described in the specification of the patent. I do not see how one step could be regarded very prop-

40



erly as more salient or important than the others.

x-Q. 22. You have stated, and I think correctly, that the problem of sound record duplication involves the accurate copying of a large number of exceedingly minute impressions and curves, and you have stated in cross examination that this copying is effected in the method in suit by contact of a material which is not new with a sound record mold which is not new. Will you please state whether or not, in your opinion, the method of the patent in suit consists in any peculiar way of bringing about that contact between the material and the mold?

A. I think the method of the patent in suit, as I have repeatedly stated, consists of a series of steps employed for producing duplicates of phonographic records or duplicating phonographic records and do not think that it relates to any particular one step in the method of so producing duplicate phonographic records.

x-Q. 23. Then I understand you, that in respect of the matter of taking an impression from the mold, the method of the patent in suit contemplates nothing peculiar or which distinguishes it from prior methods of casting or molding sound records?

A. As I have stated, I do not know the prior methods, if such existed, prior to the patent in suit of casting or molding sound records. I do find, however, that the method of the patent in suit relates to a series of steps, one of which is that of immersing a mold in molten wax-like coagulable material, another causing the material to accumulate on the bore of the mold in a layer of desired thickness, another in finishing the bore of the duplicates, and still another in separating the duplicate from the mold, resulting, as I have stated, in the production of an improved duplicate record of superior quality. I therefore do not see how I can answer your question better than I have.

x-Q. 24. Does the step of immersing of the mold in the record material differ in any respect from the ordinary method of dipping as in a ladle?

10 A. Speaking of the step as defined or described in the patent, I should say that specifically it differs in this particular: in the ladle practice, especially in metal founding the material is poured from the ladle into the mold. The patent suggests one method of filling the mold and that is of permitting the material to enter from the bottom. That suggestion, however, is not specifically defined in the claims but pertains to the apparatus which is shown in the patent as one convenient form of carrying out or performing that particular step. Speaking therefore relative to the specific apparatus shown, it differs from the ladle or pouring manner of introducing material into the mold in that it permits it to enter from the bottom of the mold.

20 x-Q. 25. I have referred in my questions to the word "immersing" which is used in every claim of the patent in suit, and what I want to know is whether that word in this specification has any peculiar meaning?

30 A. It has a meaning in my opinion suggestive of that step which results in bringing the wax-like material while in its molten condition or state into contact with the record bearing surface of the mold so that the following step can be properly carried out, namely, the step of causing the material to accumulate in the bore of the mold in the desired thickness.

x-Q. 26. Haven't you got things turned hind side before in your answer. Is it not a fact that the mold is brought into contact with the material and not the material into contact with the mold?

A. No, I think not.

40 x-Q. 27. Does not the word "immersing" signify



to your mind that the mold is inserted into the molten material?

A. Not necessarily so. I am of the opinion, however, that the term "immersing" is quite expressive of that step or act which results in the immersion or surrounding of the record surface of the mold with the material. This I think is clear from the fact that the mold 1 is so arranged that it is not in itself immersed in the material, but the wax-like material is permitted to immerse that part of the mold which carried the duplicate or the matrix. However that may be, I am of the opinion that the term is employed to define the step or act of supplying the mold or matrix with the wax-like material so that the latter may accumulate on the bore thereof in the desired thickness. 10

x-Q. 28. You say then that the words "immersing a mold or matrix in molten material," which words occur in every claim of the patent in suit, do not necessarily mean immersing the mold or matrix in the specified material? 20

A. I think it does mean that, especially in view of the fact that the object to be sought is the immersion of the record carrying surface in the specified material and in that particular it seems to me that the terms are sufficiently comprehensive and definite to include any particular manner of securing its immersion, that is to say, either by forcing the mold with its carrier into the wax or the wax into the bore of the mold. The problem is, as I understand it, to secure an immersion of that part of the mold which carries the record so that the material can accumulate on the bore in a layer of desired thickness. 30

Recess.

x-Q. 29. In carrying out the invention of the patent in suit, is it necessary or material that any 40

special way of introducing the material into the mold should be followed?

10 A. In considering this step of the method of the patent in suit, I have had in mind that particular manner of introducing the material into the mold common to both the specific way stated in the patent in suit and the way or manner employed by the defendant, that is to say, plunging the mold as a whole into the molten mass of wax-like material and that being the case I have had in mind more particularly the application of the term as applied to the methods adopted by the complainant and the defendant. I do not understand, however, that it is necessary or material to the successful performance of the method of the patent in suit that it should be always necessary to confine themselves to the introduction of the material through the bottom of the mold.

20 x-Q. 30. I put before you two methods of obtaining a casting in a sound record mold, namely, first, in which the mold is immersed in melted sound record material until the material accumulates on the inner surface of the mold in a layer of sufficient thickness to form a sound record; second, in which the material is dipped up in the mold and allowed to solidfy in the mold while the latter is out of contact with the mass of melted material; and I ask you whether or not it is material in practicing the method of the patent in suit that the first of these  
30 procedures be followed?

A. In considering this matter I understand that you have stated in your question conditions which specifically apply respectively to the complainant's and the defendant's methods. That is to say, as I have explained in my direct examination, in the complainant's patented method as carried out by the specific apparatus they have shown, the mold  
40 containing the molten mass of material is retained



into the  
mod of the  
particular  
the mold  
the pat-  
ed by the  
mold as a  
material  
ind more  
s applied  
nant and  
ever, that  
ssful per-  
suit that  
emselves  
h the bot-  
of obtain-  
ely, first,  
ed sound  
ulates on  
sufficient  
in which  
l allowed  
it c<sup>e</sup> con-  
nd I ask  
icing the  
of these  
and that  
ns which  
lainant's  
say, as I  
n, in the  
d out by  
the mold  
retained

in the kettle until the material congeals and accumulates during which interval of time the outside of the mold is maintained in a relatively cool condition so as to effect a chilling. In the defendant's method the mold is filled and the chilling is carried on after it has been removed from the kettle. I have expressed the opinion heretofore that this variation was immaterial in my judgment in practicing the method of the patent in suit and that the slight difference, that is, of cooling while in the kettle or after removal was not sufficient to constitute a material difference, but was in effect substantially the equivalent if not absolutely the same specifically. My opinion is therefore that in practicing the method invented by the patentee of the patent in suit, it is not necessary to confine it specifically to the first of the two methods that you have suggested, in fact, I have expressed the opinion that the method adopted by the defendant responds to the method defined in the third, fourth and fifth claims of the patent in suit and have given my reason for such an opinion.

10

20

30

x-Q. 31. In explaining the patent, you say that the mold is first immersed in the molten sound record material so that its record carrying surface will be intirely immersed in such material. Please state just what happens during and in consequence of the immersion of the mold in the melted material.

A. The mold is filled with the melted material. The patentees then state that the mold is kept immersed in the molten material for the desired time to secure the deposit of wax-like material of the required thickness. The mold is kept at a relatively low temperature so that the material will congeal on the same in a layer of the desired thickness, as I have heretofore explained.

x-Q. 32. So that in the process of the patent in

40

suit the solidification of the sound record occurs during the period of immersion of the mold in the melted material, does it?

A. Yes.

x-Q. 33. Suppose the mold were taken out of the bath of melted material before the solidification of the sound record, would that or would it not defeat the object of the process?

10 A. I think not. As I have stated before, the object of the step referred to is that of placing the molten wax-like material in the mold so that upon subsequent chilling it will form or accumulate on the bore of the mold in a layer of desired thickness.

x-Q. 34. Please consider the last preceding question again and state if you wish to adhere to your answer?

20 A. I have considered the question again and can see no reason why that particular step of chilling to accumulate the material on the bore of the mold is departed from by removing the mold from the kettle and permitting it to cool thereafter, in other words, as the defendant does, as I understand it, or as it might be done by closing the bottom of the mold of the patent in suit and then removing it with its loaded charge. I can see no reason for believing that carrying out the step in either of the two ways would destroy the method of the patent in  
30 suit or vary it materially.

x-Q. 35. The patent in suit states that after the mold is immersed in the melted material "The matrix or mold is thus *kept* immersed in the molten material for the desired time required to secure a deposit of the wax-like material of the required thickness." Is that a liquid deposit or a solid deposit?

40 A. The quoted part of the description is contained in that portion wherein the inventors state



that "in carrying out our process with the apparatus so far described" and should therefore be considered in that light, in my opinion. The wax-like material which is deposited on the bore of the mold 1 of the apparatus described is in a coagulated state but not in a hard condition as I understand it.

x-Q. 36. Now please tell me whether that answer means liquid or solid.

A. I should not regard it as a liquid or as a solid, that is a hard solid condition. It is more in the nature of a semi-plastic, that is it is in a condition between hard and a fluid or liquid state.

x-Q. 37. Must a solid be hard in order to be solid?

A. Not necessarily, but in referring in this wax or waxlike material when the cylinder is completed the material is in a state which could properly be termed hard.

x-Q. 38. In giving in your deposition what pur-  
ports to be an explanation of the method of this  
patent, why did you omit all reference to the fact  
that the material congeals on the mold while the  
latter is immersed in the bath?

A. I do not think I omitted that. By referring  
to my answer to question 6, I have specifically  
directed attention to the fact, using the following  
language:

"I notice, however, that in the specific ex-  
ample of defendant's method described in the  
patent in suit, the cooling act is carried on  
while the mold itself, together with its carrier  
or receptacle is in the kettle containing the  
heated wax-like material; while in the defend-  
ant's method the mold with its charge of heat-  
ed wax is removed from the kettle and the  
cooling or chilling step is effected or carried  
out thereafter."

x-Q. 39. Was it in question 6 that you were

asked to explain the method of the patent in suit?

A. It was in question 6 that I explained that feature of the patent in suit, the question having been directed to the comparison between the complainant's and the defendant's method.

10 x-Q. 40. In carrying out the method of the patent in suit, suppose the mold were kept immersed until the congealed material remelted, would or would not that defeat the object of the process?

20 A. If you are referring to the method as carried out by the apparatus described, which apparatus the inventors state is simply merely illustrative of an apparatus whereby their method could be carried out, I do not believe that the inventors had in mind the heating of the mold in that apparatus so that the wax would not congeal. I am not sure that the surrounding air jacket of the apparatus would permit the heating of the mold sufficiently to melt the wax but observe that the inventors suggest a retention of the mold in the kettle for about "three minutes." They also suggest that the time may vary with the peculiar conditions under which the process may be carried out. I also notice that they suggest that the temperature should not be permitted to raise sufficiently to permit the deposited molten material thereon to become remelted, whether that is by the heat of the material or through the wax I would not like to say.

30 x-Q. 41. I have not asked you what the inventors may or may not have had in their minds, which is utterly immaterial, but what they have stated in the specification, and I now ask you if you do not find in the specification the following statement: "but in no instance should the matrix or mold be immersed within the molten material for a long enough time to allow its temperature to be raised sufficiently to permit the deposited molten material thereon to become remounted?"

40



A. Yes.

x-Q. 42. Now in defendant's process, is the matrix or mold kept immersed in the molten material for the time required to secure a deposit of the wax-like material of the required thickness?

A. Defendant's method contemplates the retention of the wax-like molten material in contact with the mold until the same becomes congealed in a layer of the desired thickness, just as I have heretofore explained in reference to complainant's patented method. The difference is, that complainants chill or cool the material in the mold while the mold with its load of molten wax is in the kettle, while the defendants perform the act of chilling after the mold is removed from the kettle. In the defendant's process the record surface of the mold is kept immersed, just as in complainant's process. This I think is obvious, and during this record surface immersion the chilling act is performed. As I have explained, however, the defendant removes his mold from the molten mass in the kettle and in that respect differs from the complainant's method. The difference in my mind seems immaterial as the step of immersion is the same, and the step of chilling is the same.

x-Q. 43. Is that answer intended to be affirmative or negative?

A. If the question, as I understand it, refers to the period of the immersion of the mold and its tray or carrier in the kettle, the answer is in the negative, as has been my effort to explain for the reason that the cooling effect does not take place in the defendant's method until after the tray and the mold has been removed from the kettle.

x-Q. 44. The specification states that in no instance should the mold be immersed within the molten material for a long enough time to remelt the deposited layer. Is it not a fact that in defendant's

process the mold is kept immersed in every instance for a long enough time not only to remelt a deposited layer if any had been deposited, but to actually superheat the same?

10 A. I think that is correct, speaking of defendant's method as distinguished from the method carried out by the apparatus shown in the patent in suit. I do not think it would be a material departure in doing just that thing when the apparent aim and purpose of the two methods are the same.

x-Q. 45. In complainant's patented process, is it not the reduced temperature of the mold relative to the temperature of the material that causes the latter to deposit on the mold?

A. Yes.

x-Q. 46. To accomplish that, it is of course necessary that the temperature of the mold should be lower than the melting point of the materials?

20 A. Yes, naturally.

x-Q. 47. In defendant's process, is the mold when immersed in the melted material lower in temperature than the melting point of the material?

A. I understand it is, in the first instance, but subsequently becomes heated to substantially the same temperature.

x-Q. 48. Is it ever cold enough to cause a deposit of the melted material when immersed therein?

30 A. When the mold is in the kettle, if it is cold enough primarily, it would undoubtedly accumulate some wax on both the inside and the outside, but my understanding is that the mold is kept in the heated bath until it is of a temperature substantially that of the surrounding material, or at least of a temperature which would prevent the accumulation of the material on the sides by congealing.

40 x-Q. 49. In carrying out the patented method, is it or not essential that the outside of the mold



should be protected from the contract with the melted material?

A. No, I think not. In the method described as carried out by the apparatus shown and described the inventors contemplated doing that thing, but I do not find that the patent is restricted in that particular. I further state that in the actual operation of the method, as I have seen the same, that feature is retained and has been highly successful as I understand. 10

x-Q. 50. The patent describes immersing the mold in the bath of molten wax-like material, whereby a coating or covering of such material will be deposited upon the interior of the mold by reason of its lower temperature, and then says "after thus securing a sufficiently thick coating of material on the interior of the matrix or mold we remove the latter from the bath." Do you find anywhere in the specification a statement to the effect that the mold can be removed from the bath before the material has congealed thereon in a sufficient layer? 20

A. No. The patentees have undoubtedly stated what they then regarded as their best known form of procedure and have described the same in connection with the apparatus shown and in that particular the removal of the mold from the kettle or bath before the material had been deposited is not referred to specifically, but I am still impressed with the statement that the inventors have made, to the effect that the apparatus is illustrative only and that they can utilize any suitable apparatus for the purposes of their carrying out their invention. In using the apparatus shown they do not contemplate removing it before the material has accumulated on the bore of the mold. The claims however, to which my attention has been called, do not define the method as being confined entirely to the particular apparatus shown. 30 40

x-Q. 51. In defendant's process, does the molten material fill the bore of the mold when the latter is immersed in the former?

A. Yes, the bore in that particular being the space between the central pin and core, and the record bearing surface of the mold. That is my understanding.

10 x-Q. 52. Is it not a fact that in defendant's process the bore of the mold is very largely filled by a core?

A. Yes, leaving however between the core and the record bearing surface of the bore ample space for the molten material to flow into.

20 x-Q. 53. Now does not the patent in suit disclose a method which consists with other features in this, immersing a mold in a bath of melted wax-like material whereby said material fills the bore of the mold while the exterior of the mold is excluded from contact therewith the relative lower temperature of the mold causing the material to congeal on the inner surface thereof until a layer of the desired thickness is obtained, after which the mold with the congealed layer is withdrawn from the bath?

A. I think the patent covers the method as stated and comprehends such a method.

30 x-Q. 54. Do you draw a distinction between "consists" which was the words used in my question and the word "cover" or "comprehend" which was the word used in your answer?

40 A. I do not think the method defined in the patent is a method limited to the functions of an apparatus or the apparatus shown in the patent, and I therefore do not think the invention of the patent consists wholly in the function of the apparatus stated, but more largely in the method which "consists" of a series of steps. I should therefore prefer to state that the method that you have stated in your question comes within the in-



vention described and claimed in the patent.

x-Q. 55. I have asked you whether or not the method of the patent in suit "consists" in a procedure carefully defined in my x-Q. 53, and I now ask you again to answer that question in such a way that there shall be no doubt as to your meaning.

A. Reading your question, x-Q. 53, again I would state that the patent in suit does disclose a method which "consists" with other features, the feature referred to in your question, but in asserting the question as I have I do not wish of course to understand that the inventors have confined themselves to this method referred to in the question but rather have seen fit to state in definite language that their method not only "consists" in doing what the question inquires about, but also and more generally relates to the conceptive idea of a method whereby the useful purpose and function of the invention can be carried out, namely a method for producing duplicated phonographic records which can be carried out expeditiously and economically and which will result in a record of a superior quality.

x-Q. 56. Where have the patentees made the statement which in your last answer you have said they have seen fit to make?

A. In the three claims inquired about and in this connection I am also mindful of the paragraph commencing with line 50, page 1.

x-Q. 57. The three claims which you have discussed in your testimony appear to differ from claims 1 and 2 mainly in that they include the step of "finishing the bore of the duplicate so secured." Is that your understanding of the substantial difference between the claims sued on and claims 1 and 2?

A. My examination has not been directed to claims 1 and 2 or six and seven, and I have not given those claims any consideration, and I am therefore not prepared to answer that question.

10 x-Q. 58. Is it possible that in studying this patent for the purpose of giving so expert deposition and of expressing an opinion upon claims 3, 4 and 5, you have not compared those with claims 1 and 2, to see wherein they differed therefrom?

A. My consideration of this patent has been limited to claims 3, 4 and 5, and I have not been called on to consider, compare or analyze the other claims. I may have read them sometime back, but not with a view of analyzing them or considering them as to what they covered or what the invention therein defined might be.

20 x-Q. 59. If the claims in suit do specify identically the same method of securing a sound record which is set forth in claims 1 and 2, and in identically the same language, differing therefrom mainly in adding the step of "finishing the bore of the duplicate so secured," you will agree with me, I suppose, that that fact gives special prominence to the step of finishing?

30 A. As I have stated, I have not been called on to consider claims 1 and 2 and I do not think that I should be called on to express an opinion relative thereto as compared with the claims to which my attention has been called and which I have been called on to consider. I do not think that the claims 3, 4 and 5, which I have considered are claims which should be considered as a whole and as expressive of the invention of the patent and as such all the elements of the respective claims should be taken together in the recited order as defining the invention. I have explained my understanding of claims 3, 4 and 5 and in that particular have pointed out that the finishing of the bore

40



of the duplicate so secured was a step of the invention defined in the claims.

x-Q. 60. In all the claims including those sued on, the method is said to consist in immersing the mold in the melted material "whereby the material will accumulate on the bore of the matrix or mold and chill thereon in a layer of desired thickness." Do you understand from this that the accumulation of the layer of material is a consequence of the immersion of the mold in the material? 10

A. I do not know about the claims other than those sued on but as I have heretofore explained the immersion of the mold to secure the proper amount of material within its bore is a step referred to in the various claims, 3, 4 and 5 and the causing of the material to accumulate on the bore of the mold by cooling or chilling is another step and to that extent the accumulation of the material on the bore of the mold is a consequence of the immersion of the mold or the loading of the mold with the molten waxlike material so that the same can so accumulate. 20

x-Q. 61. I have just called your attention to the fact that in all of the claims of the patent in suit including claims 3, 4 and 5, the congealing of the material on the bore of the mold is directly connected with the immersion in the relation of effect and cause by the word "whereby." That being an undeniable fact, please state why you have in explaining each of the claims in suit ignored this relation and stated that the claim consists "first in immersing the mold" and "second in chilling the material" thus making these separate and distinct steps instead of a connected relation as in the claims? 30

A. I shall again repeat that I have not considered claims 1, 2 or 6 or 7, but have explained my understanding of claims 3, 4 and 5. Now referring to the second step which I have explained as being 40

that step of cooling or chilling and which is a step common to the three claims, it seems to me obvious, not only from reading the description of the patent in suit but also from reading the claims themselves, that the chilling or cooling of the mold or wax-like material within the mold so that the material will accumulate in a layer of the desired thickness is in itself a step in the method. Certainly the act of immersion alone within the heated wax-like material would not result in the chilling of the material. The specification clearly states that the mold is first filled and refers to the special apparatus in which the mold is thus kept immersed in the molten material for the desired time required to secure a deposit of the wax-like material of the required thickness. I do not understand that the act of immersion as a well defined step in the method also comprehends the act of cooling or chilling. The statement whereby the material will accumulate on the bore "in my judgement represents a distinct step in the process, that is, a cooling step resulting in this accumulation of the material in layers of the desired thickness.

x-Q. 62. Immersing is the first step, is it?

A. Of the three claims, yes.

x-Q. 63. And chilling is the next step of the three claims, is it?

A. In my opinion, yes.

x-Q. 64. Now how is the chilling effected otherwise than as the result of the immersing?

A. Naturally there would be no chilling of the material unless the mold was filled and therefore the chilling is, in my opinion, an act subsequent to the filling but manifestly dependent upon the filling. In other words, the order of sequence of the steps properly stated would first be immersing or filling and second cooling or chilling. I cannot conceive how the claims could be otherwise interpreted.



x-Q. 65. What, if anything, is done to bring about the chilling other than immersing a cold mold in the melted material?

A. As I have explained in my direct examination, in the specific method explained in the patent in suit, the patentees explain the same as first, immersing or filling the mold, and then allowing the same to remain a sufficient length of time to chill the material contained within the mold, the chilling act is carried on while the mold is in the kettle, differing in that respect from the defendant's method who performs the chilling act after the mold has been removed from the kettle. This I think I have fully explained heretofore.

10

x-Q. 66. You have not answered my question. Please do so.

A. I thought that I had answered your question fully. I certainly intended to. To repeat somewhat, the act of permitting the mold to remain a sufficient length of time to cause the chilling, the mold being relatively cool, is a thing that is done plus the fact that the mold is cooled continuously by the surrounding air, the outer face of the mold being kept from contact with the heated body of material. The immersing does not bring about the chilling, as I understand it, but rather the retention of the mold not only in a cooled condition but in its position relative to the filled core.

20

x-Q. 67. Is not the act of permitting the mold to remain in the melted material exactly what is meant by the word "immersion?"

30

A. It is not the act of immersion, in my opinion.

x-Q. 68. Is not the mold immersed until it emerges?

A. Undoubtedly.

x-Q. 69. Now I will ask you again why in explaining the claims in suit you have in every instance ignored the word "hereby" and its meaning?

40

10 A. For the plain reason that the step of immersing is not the step of cooling and the "whereby" of the claims cannot, in my judgment, refer to the active step of immersion, in fact it would be hard to indicate or understand that the cooling is effected by immersion. In my opinion, "whereby" is an expression used by the patentees in connection with the second step of their process and as expressive of the fact that the material collected in the mold is positioned therein and in such position is cooled or chilled so that the layer of the desired thickness will be deposited on the bore of the mold.

x-Q. 70. Was not your reason for ignoring the word "whereby" this, that without doing so you could not possibly make out a case of similarity between defendant's process and the process defined in the claims in suit?

20 A. Not at all, to my mind, the meaning was obvious and clear and so appealed to me before I knew what the defendant's method really was.

x-Q. 71. Does defendant insert the mold in the material in an inverted position?

30 A. From the stipulation and testimony of Mr. Weber, I am lead to believe that they plunged the mold into the bath and it becomes filled with the material. The testimony and stipulation do not state specifically, as I now recalled, that the mold is tipped inverted or put down with the open mouth upward.

x-Q. 72. Does defendant protect the outside of his mold from contact with the melted material?

A. My understanding is that he does not.

x-Q. 73. Does defendant employ any means such as a cap at the top of the mold to prevent overflow?

A. Not that I recall.

40 x-Q. 74. Does the defendant immerse in the melted material a mold cold enough to congeal such material on its inner surface?



A. The mold, as I understand it, which is used by the defendant is comparatively thin and while it is probably somewhat colder than the bath of material, I understand that it is designedly left in the material sufficiently long to become sufficiently high in temperature to prevent the material from adhering to the outside.

x-Q. 75. Does defendant immerse the mold in the melted material until a layer of the required thickness congeals thereon? 10

A. The defendants, as I have often repeated, remove the mold from the bath of melted wax-like material, with the bore of the mold filled with the heated wax-like material to an extent that the latter completely immerses or covers the record bearing surface thereof and thereafter cools or chills the material by first cooling the mold so that the layer of requisite thickness congeals thereon.

x-Q. 76. Then your answer to the next preceding question is "no," isn't it? 20

A. I think a more proper answer would be yes, with this qualification that the mold as a whole is taken from the bath leaving the important part, namely the record surface, still immersed in the fluid.

x-Q. 77. Then as you read this patent, and as you understand the word "immerse" the mold is still immersed in the melted material after it has been removed from it? 30

A. As I have explained before, the purpose of the invention largely is to secure the immersion of the record bearing part of the mold and to thereafter cool the material so immersing or covering the record part of the mold, so as to cause the material to accumulate in the bore of the mold in a layer of the desired thickness.

x-Q. 78. So that, if you were to pour some of the melted material into the mold, thereby filling it, the 40

sound record surface would be immersed in that material?

A. I have not considered it from that point of view as both the defendant and the complainant bodily plunge their molds into the bath of wax-like material and certainly by that method, immerse the mold, particularly the active part thereof which is the record bearing bore.

10 x-Q. 79. But you have just said that the mold is to all intents and purposes as much immersed after it has been taken out of the bath as while in it. Do you adhere to that?

A. I have stated that the record bearing surfaces of the mold after it has been immersed is maintained in an immersed state whether in or out of the mold in defendant's structure and have used the term in that connection as covering the record surface. I do not wish it understood as saying, however, that the mold itself after having been plunged into the bath and immersed therein is immersed as a whole when taken from the bath.

20 x-Q. 80. Defendant's sound record mixture is superheated to a temperature of 350° F, and the mold is immersed in that material and kept there until the portion of the material in the mold is thoroughly superheated. Is that your understanding?

A. Yes, to the temperature of the material in the kettle.

30 x-Q. 81. Would it be practically possible to carry on the method of the patent in suit in the manner described in that patent with a sound record material superheated to 350° Fahrenheit?

A. I have no reason to believe that it would not, for the patentees stated in their patent that "it will be understood that the matrix or mold may be made of increased thickness or artificially cooled before the dipping operation when the composition is of

40



a character requiring an increased cooling effect to secure the desired thickness of the deposit."

Adjourned to meet Tuesday, October 30, 1906, at 10:30 A. M.

October 30, 1906. Met pursuant to adjournment. Parties present as before.

Cross-examination continued by Mr. MAURO:

x-Q. 82. All the claims in suit specify as one of their steps finishing the record before removing it from the mold. What is the importance of doing this? 10

A. The patentees state as follows: commencing with line 91, page 2:

"The reaming of the interior of the duplicate is preferably carried on before the resulting duplicate has cooled sufficiently to become hard and before it has contracted from the bore of the matrix, whereby the reaming operation can be carried on effectively and smoothly." 20

Seemingly this statement of the inventors indicates the purpose and importance of that step by the above quoted statement.

x-Q. 83. Does the finishing of the record while in the mold differ in any substantial and practical way from the finishing of the record wholly or in part after its removal from the mold?

A. That I would not like to say, in view of the fact that I have never seen a method performed by finishing the record after it was removed from the mold but I am mindful of the fact that the inventors have stated that the reaming operation can be carried on effectively and smoothly before the duplicate becomes hard and contracted. 30

x-Q. 84. Do you regard the finishing of the record while yet in the mold as an essential step of the claims in suit?

A. As much so as any of the other steps. The 40

method, as such, relates to a series of steps and not to any one particular step.

x-Q. 85. Do you see any co-operative relation between immersing and finishing before removal from the mold?

10 A. As I have stated, the method consists of a series of steps which are performed in sequence and therefore in carrying out the method by resorting to the steps disclosed and explained in the patent, necessarily there would be co-operation between the various steps in the production of the duplicated phonographic record.

x-Q. 86. You say, do you, that in any sequence of operations there must of necessity be co-operation between all the members of the series, do you?

20 A. I say that in carrying out or performing the method of the patent the various steps co-operate, in my opinion, in the performance of the method and the production of the article.

x-Q. 87. Was the reaming tool a tool in common and general use before the application of the patent in suit?

A. Generally speaking, I can say yes, but in this particular specific art I am not prepared to state whether it was or was not.

x-Q. 88. Does your unpreparedness arise from your ignorance of this art?

30 A. Not exactly.

x-Q. 89. Does the reaming tool perform in this method the ordinary operation of a reaming tool?

40 A. Of course the general art of reaming, as applied to the metal art specifically, deals largely with the material different from the material employed in the art of making phonographic records. Whilst generally speaking reaming, as such, is a well known step in the metal arts, in comparing the same with the reaming of material used for producing records it seems to me that various matters should



be considered. As for instance, the ordinary art of reaming is carried on, as I understand it, generally by cutting out small parts and progressing gradually from one end to the other of the bore of the article being reamed. In that respect, the present reaming as described in the patent differs in that the cutting out of the material continues throughout the entire inner surface toward the outer surface of the cylinder. Therefore referring to the apparatus of the patent I should say that the reaming tool, so called, does not act or perform its method as the ordinary reaming tool performs its method. I am referring, of course, to the particular construction shown in the patent. 10

x-Q. 90. Why do you make a comparison with a metal article, instead of comparing the operation with that of reaming the sound record cylinders as the same has been done prior to the application for the patent in suit? 20

A. My attention has not been called to any prior art of reaming in this particular art, and therefore I have made the comparison in that well known art of metal reaming.

x-Q. 91. Is the operation of a reaming tool, a purely mechanical operation?

A. Reaming is done by machinery and also by hand, as illustrated in the patent in suit.

x-Q. 92. I have asked you, not how reaming is done, but whether the operation of a reaming tool is a purely mechanical operation? 30

A. Generally speaking, the operation of a reaming tool is a mechanical operation, in my opinion.

x-Q. 93. From reading the specification of the patent in suit, I conclude that the gist or essence of the method it discloses consists in immersing a cold mold in a bath of melted wax-like material, allowing the mold to remain there until the material congeals on its inner surface in a layer of suffi- 40

cient thickness to constitute a sound record, and in removing it from the bath before the heat of the latter remelts the congealed layer; and that in performing this operation it is essential that the exterior of the mold should be protected from contact with the melted material. Do you dispute this?

10 A. You have stated the specific manner of performing the method with the apparatus disclosed in the patent, but as I have repeatedly stated the invention, that is to say, the method invented by the patentees and defined in the claims is a method of producing reproduced or duplicated phonographic cylinders or records in an expeditious and economical manner. The inventors, have not, in my opinion, suggested that their invention was limited in every particular to the apparatus disclosed or the use of the particular apparatus. I would therefore  
20 answer your question in the negative, to the effect that the gist or essence of the invention was not the immersing of a cold mold in a bath of melted material, that is in the kettle, and allowing the same to remain in the kettle and to harden it while in the kettle but, as I have repeatedly stated, the inventive idea set forth in the patent comprehended and including the carrying out of the method by apparatus other than that illustrated and described and, by referring to claims 4 and 5, it will be observed  
30 that the steps recited are not recited in terms which would justify the belief that the inventors' method was confined to leaving the matrix as a whole in heated wax-like material in the kettle and performing the cooling act or step at that time. I have explained my opinion or views on this matter in my answers heretofore given.

x-Q. 94. In forming an opinion as to the scope of a patent, do you ordinarily give consideration to the prior state of the art as well as to the language of the patent itself?  
40



A. My opinion so far as I have stated it has been formed by reading the patent itself and without reference to the prior art, if there be any, effecting this particular method.

x-Q. 95. Of course your opinion might be very much modified depending upon what the prior state of the art should happen to be?

A. I think that is true. But as I have stated before I have had no occasion to examine the prior art relative to this particular method. 10

x-Q. 96. Did you consider that it was not necessary to know anything about the art in order to qualify you as an expert witness?

A. My qualifications as an expert witness was not, as I understood it, dependent upon an examination of the prior art in this particular line but was largely dependent upon my experience in examining patents and dealing in patent matters. 20

x-Q. 97. Unquestionably the prior state of the art is an essential factor in determining the scope of any patent, is it not? 20

A. As a legal proposition I believe that is correct, but in the present matter I have been called on to consider the patent in suit and to compare it with the defendant's method, limiting my consideration under instructions to the third, fourth and fifth claims of the patent.

Re-direct examination by Mr. DYER:

Rd.-Q. 98. Are you able to say from your familiarity with the proceedings in the Patent Office whether it is the practice of the examiners in considering the patentability of inventions presented in applications pending before them to examine into the prior art? 30

A. That is the principal duty of the examining corps in the patent office.

Signature and certificate waived.

Testimony closed. 40

UNITED STATES CIRCUIT COURT.

Southern District of West Virginia.

10	NATIONAL PHONOGRAPH COM- PANY,	} In Equity, On Letters Patent No. 683,676.
	<i>Complainant,</i>	
	<i>vs.</i>	
	AMERICAN GRAPHOPHONE COM- PANY,	} Defendant.
	<i>Defendant.</i>	

**BILL OF COMPLAINT.**

20 *To the Honorable, the Judges of the United States  
Circuit Court for the Southern District of  
West Virginia:*

30 NATIONAL PHONOGRAPH COMPANY, a corporation  
organized and existing under and by virtue  
of the laws of the State of New Jersey and hav-  
ing its principal place of business at West Orange,  
in the County of Essex and State of New Jersey,  
brings this, its bill of complaint, against Amer-  
ican Graphophone Company, a corporation organ-  
ized and existing under the laws of the State of  
West Virginia and a citizen and resident of said  
State.

And thereupon your orator complains and says:

40 1. That heretofore and before the 31st day of  
July, 1900, Jonas Walter Aylsworth and Walter  
Henry Miller being then as now residents of East  
Orange and Orange, respectively, in the County of  
Essex and State of New Jersey, and both citizens of  
said State, were the original, first and joint inven-



tors of a certain new and useful apparatus for duplicating phonographic records, not known or used by others in this country before their invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country before their invention or discovery thereof, or more than two years prior to their application for a patent therefor in this country as hereinafter set forth, and not in public use or on sale in this country for more than two years prior to their said application, and which had not been abandoned; and which invention or improvement was not first patented or caused to be patented by the said inventors or their legal representatives or assigns in a foreign country upon an application filed more than seven months prior to the filing of the said application in this country. 10

II. That the said Aylsworth and Miller, being as aforesaid the first inventors and discoverers of the said improvement, on the 31st day of July, 1900, jointly made application in writing to the Commissioner of Patents of the United States for the grant of Letters Patent therefor, and paid into the Treasury of the United States the fees required by law, and then and there fully and in all respects complied with all the necessary conditions and requirements of the statutes of the United States in such case made and provided, and by a proper instrument in writing, duly executed and delivered, and duly recorded in the Patent Office, sold and assigned to your orator, National Phonograph Company, the full and entire right, title and interest in and to the said invention and application and the Letters Patent to be granted in pursuance of said application, and requested the Commissioner of Patents to issue the said patent to your orator as their assignee, and thereupon, after due examination having been made 20 30 40

by the Commissioner of Patents as to the novelty and utility of the said invention as provided by law, the Commissioner of Patents caused to be issued to your orator, National Phonograph Company, Letters Patent in due form of law, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing date the 1st day of October, 1901, and numbered 683,676; and that the said Letters Patent did grant unto your orator and unto its successors or assigns, for the term of seventeen years from the date thereof, the exclusive right to make, use and vend the said invention throughout the United States and the Territories thereof, as by said Letters Patent or a duly authenticated copy thereof in court to be produced will more fully and at large appear.

20     III. That your orator has been ever since the grant of said Letters Patent as aforesaid, and is now the sole and exclusive owner of said patent and the rights secured thereby, and of all claims for damages and profits arising from infringement thereof.

30     IV. That your orator is engaged in the manufacture of phonographic records produced by the employment of said improvement or invention, and has so manufactured and sold large quantities of such phonographic records, and has invested and expended large sums of money and has been to great trouble in and about the said invention for the purpose of introducing the same and making the same profitable to your orator and to the public; and your orator believes that it will realize and receive large gains and profits therefrom if infringement by the said defendant and its confederates be prevented.

40



V. That the said defendant, well knowing the premises and the rights secured to your orator as aforesaid, but contriving to injure it and to deprive it of the benefits and advantages which might and otherwise would accrue unto it from the said invention, did, after the grant of said Letters Patent and before the commencement of this suit, as your orator is informed and believes and therefore avers, in the City of Bridgeport, State of Connecticut and elsewhere in the United States, without license or allowance and against the will of your orator and in violation of its rights, unlawfully and wrongfully make, or cause to be made, and is now making, or causing to be made, phonographic records by the employment of the said improved apparatus for duplicating phonographic records employing and containing the invention set forth in the Letters Patent aforesaid, and did use or cause to be used, as aforesaid, the said invention in the manufacture of said phonographic records; and that it still continues so to do, and that it threatens to continue the aforesaid unlawful acts to a large extent, all in defiance of the rights secured to your orator as aforesaid, and to its great and irreparable loss and injury, and by which your orator has been and still is being deprived of great gains and profits which it might and otherwise would have obtained, but which have been received and enjoyed by the said defendant through its said unlawful acts and doings. And your orator further shows that as to how many phonographic records the defendant has as aforesaid unlawfully made, and as to the extent of the gains and profits received and enjoyed by it from such unlawful making, your orator is ignorant and prays a discovery thereof.

VI. That the manufacture of phonographic records by the employment of the invention set forth in

the Letters Patent aforesaid by the defendant, and its preparation for and avowed determination to continue the same in disregard and defiance of the rights to your orator, have the effect to encourage and induce others to venture to infringe said Letters Patent.

10 VII. Your orator therefore prays that the said defendant, American Graphophone Company, and its officers, servants, agents, attorneys, employees, workmen and confederates, and each and every of them, may be perpetually restrained and enjoined, by the order and injunction of this Honorable Court, from directly or indirectly making phonographic records by the employment of the invention of the Letters Patent aforesaid, and from directly or indirectly making, constructing, using, vending, 20 delivering, working, or putting in operation or use, or in anywise counterfeiting or imitating the apparatus for duplicating phonographic records described and claimed in the aforesaid Letters Patent No. 683,676, or any apparatus made or operated in accordance therewith or like or similar to those which it, the said defendant, has hitherto employed in the manufacture of duplicate phonographic records in infringement of said Letters Patent, and that they, and each and every of them, be ordered to deliver 30 to your orator, or to an officer of this Court, for destruction, all apparatus used by the defendant in infringement of said Letters Patent and that the said defendant may be decreed to pay the costs of this suit, and that your orator may have such other and further relief as to this Honorable Court shall seem meet and as shall be agreeable to equity.

40 VIII. Your orator further prays that an injunction *pendente lite* be granted, issuing out of and under the seal of this Honorable Court, enjoining



and restraining the said defendant and its officers, servants, agents, attorneys, employees, workmen and confederates, and each and every of them, to the same purport, tenor and effect as hereinbefore prayed for with regard to said perpetual injunction.

IX. And forasmuch as your orator can have no adequate relief save in this Court, to the end therefore that the said defendant may, if it can, show why your orator should not have the relief hereby prayed, and may, but not upon oath, an answer under oath being hereby expressly waived, according to the best and utmost knowledge, remembrance, information and belief of its officers, full true, direct and perfect answer make to the premises and to all the several matters hereinbefore stated and charged, as fully and particularly as if the same were here repeated, and it especially interrogated as to each and every of said matters, and may be compelled to account for and pay to your orator the profits by it acquired, and the damages suffered by your orator from the aforesaid unlawful acts, and that the Court may assess said profits and damages, and may increase the damages to a sum not exceeding three times the amount thereof:

May it please your Honors to grant unto your orator a writ of *subpoena ad respondendum* issuing out of and under the seal of this Honorable Court, directed to the said defendant, American Graphophone Company, commanding it, by a certain day and under a certain penalty, to be and appear in this Honorable Court, then and there to answer to the premises, and to stand to and abide such order and decree as may be made against it.

And your orator will ever pray. 40

80      *Bill of Complaint, Patent 683,676.*

NATIONAL PHONOGRAPH COMPANY,  
By WILLIAM E. GILMORE,  
President.

HENRY M. RUSSELL,  
Solicitor for Complainant.  
FRANK L. DYER,  
Of Counsel.

10      STATE OF NEW JERSEY, }  
COUNTY OF ESSEX.        } ss.

20      WILLIAM E. GILMORE, being duly sworn, deposes and says, that he is the president of the National Phonograph Company, the complainant named in the foregoing bill of complaint; that he has read the said bill and knows the contents thereof; that the same is true to his own knowledge save as to the matters therein stated to be alleged on information and belief, and as to those matters he believes it to be true; and that he verily believes Jonas Walter Aylsworth and Walter Henry Miller to be the first, original and joint inventors of the improved apparatus for duplicating phonographic records set forth in said Letters Patent numbered 683,676, referred to in the said bill of complaint.

WILLIAM E. GILMORE.

30      Sworn to and subscribed before  
me this 30th day of June, 1905.

[SEAL] J. F. RANDOLPH,  
Notary Public of New Jersey.

40



IN THE UNITED STATES CIRCUIT COURT.  
Southern District of West Virginia.

NATIONAL PANY,	PHONOGRAPH	COM-	In Equity, On Miller & Aylsworth Pat- ent No. 683,676 (Apparatus).	10
	vs.			
AMERICAN PANY.	GRAPHOPHONE	COM-		

ANSWER.

This defendant, now and at all times hereafter, saving and reserving unto itself any and all benefits and advantages of exception which can or may be had or taken to the many errors, uncertainties and other imperfections in the said complainant's bill of complaint contained, answering thereto or to so much and such parts thereof as it is advised it is material or necessary to make answer unto, says:

That as to whether complainant is a corporation organized and existing under the laws of the State of New Jersey, with its principal place or business at West Orange in said State, this defendant does not know and is not informed, save by the bill of complaint herein, and therefore calls upon complainant for proof thereof; but this defendant admits that it is a corporation organized and existing under the laws of the State of West Virginia.

I.

Defendant denies each and every allegation of paragraph 1 of the bill of complaint.

II.

Defendant admits that U. S. letters-patent No. 683,676 were issued to the National Phonograph

Company on October 1, 1901; but on information and belief denies the other allegations of paragraph II. of the said bill of complaint, defendant not being informed save by said bill.

III.

Not being informed save by the bill of complaint, defendant denies the allegations of paragraph III. thereof;

IV.

Not being informed save by the bill of complaint, defendant denies the allegations of paragraph IV. thereof;

V.

Defendant denies the allegations of paragraphs V. and VI. of the bill of complaint; and, more specifically, defendant denies that it has in any way infringed, or has prepared or intends to infringe, the letters-patent in suit, and further denies that it has committed any acts whatsoever which would encourage and induce others to infringe the same.

VI.

Defendant avers on information and belief that the said Jonas Walter Aylsworth and Walter Henry Miller were not the original, first and sole inventors or discoverers of the alleged invention or improvement set forth in U. S. letters-patent No. 683,676, or any substantial or material part thereof; that the same and each and every substantial part thereof were, long prior to the said alleged invention, set forth in the following letters-patent and publications, namely:

Letters-patent of the United States:

No. 13,117, June 19, 1855, Otis;

No. 33,884, Dec. 10, 1861, Gwynne;

No. 37,898, Mar. 17, 1863, Bonanzo;



formation  
paragraph  
not be

omplaint,  
graph III.

omplaint,  
graph IV.

graphs V.  
re specifi-  
way in-  
tinge, the  
that it has  
could en-  
same.

belief that  
lter Hen-  
l sole in-  
ention or  
tent No.  
rt there-  
bstantial  
lleged in-  
tent and

- No. 95,645, Oct. 12, 1869, Brunner;  
No. 108,306, Oct. 11, 1870, Van Haagen;  
No. 185,094, Dec. 5, 1876, Wilder;  
No. 255,449, Mar. 28, 1882, Pedrick;  
No. 281,529, July 17, 1883, Lefferts;  
No. 303,970, Aug. 26, 1884, Appelt;  
No. 326,049, Sept. 8, 1885, Muncaster;  
No. 327,160, Sept. 29, 1885, Hackman & Walter;  
No. 334,786, Jan. 26, 1886, La Bau; 10  
No. 359,637, Mar. 22, 1887, Schuberth;  
No. 368,851, Aug. 23, 1887, Philion;  
No. 392,796, Nov. 13, 1888, Hadley;  
No. 400,649, Apr. 2, 1889, Edison;  
No. 408,998, Aug. 13, 1889, Tattershall;  
No. 414,761, Nov. 12, 1889, Edison;  
No. 437,429, Sept. 30, 1890, Edison;  
No. 445,932, Feb. 3, 1891, Murname & Drosten;  
No. 466,728, Jan. 5, 1892, Smith;  
No. 484,582, Oct. 18, 1892, Edison; 20  
No. 493,191, Mar. 7, 1893, Smith;  
No. 525,116, Aug. 28, 1894, Richards;  
No. 528,273, Oct. 30, 1894, Lioret;  
No. 563,572, July 7, 1896, Day;  
No. 573,564, Dec. 22, 1896, Ziegler-Reinacher;  
No. 657,527, Sept. 11, 1900, Edison.  
No. 661,143, Nov. 6, 1900, Grasser;  
No. 662,857, Nov. 27, 1900, Hett;  
No. 662,858, Nov. 27, 1900, Hett;  
No. 666,493, Jan. 22, 1901, Capps; 30  
No. 666,720, Feb. 5, 1901, Edison.  
No. 666,819, Jan. 29, 1901, Reynard;  
No. 666,937, Jan. 29, 1901, Petit;  
No. 667,662, Feb. 5, 1901, Edison;  
No. 682,991, Sept. 17, 1901, Macdonald;  
No. 682,992, Sept. 17, 1901, Macdonald;

Letters-patent of Great Britain:

- No. 1478, of 1894, Young; 40

Publications as follows:

Knight's Mechanical Dictionary, Volume 2, 1880, pages 1461-1462;

Knight's Mechanical Dictionary, Volume 3, 1880, page 2169;

10 also many other letters-patent and publications as to the dates, numbers, and description of which defendant is at present ignorant, but which it begs leave to disclose as soon as the same shall have been ascertained and to amend this answer by inserting the same allegations concerning such other letters-patent and publications as are hereinbefore made concerning those now known to this defendant as aforesaid.

#### VII.

20 This defendant avers, on information and belief, that the said Aylsworth & Miller were not the original, joint and first inventors or discoverers of the alleged invention or improvement set forth in said letters-patent No. 683,676, or any material or substantial part thereof, and further avers that the said alleged invention or improvement, and each and every substantial and material part thereof, were, long prior to the said alleged invention either known to or used by, or both known to and used by the following persons at the places hereinafter named, to wit:

30 Thomas A. Edison, of Llewellyn Park, New Jersey;  
Place of use: Llewellyn Park, New Jersey;  
Frank L. Capps, of Newark, New Jersey;  
Place of use: Newark, New Jersey;  
James K. Reynard, of Newark, New Jersey;  
Place of use: Newark, New Jersey;  
Ademore N. Petit, of Newark, New Jersey;  
Place of use: Newark, New Jersey;  
40 Thomas H. Macdonald, of Bridgeport, Connecticut;  
Place of use: Bridgeport, Connecticut.



VIII.

This defendant avers, on information and belief, that the said letters-patent does not disclose or show any invention whatsoever in view of the state of the art of manufacturing sound records and analogous arts, as they existed at and long before the said Aylsworth & Miller made the alleged improvement set forth in said letters-patent; and that, in view of the said state of the art, said alleged improvement was not patentable, and involved, if anything mere mechanical skill. 10

IX.

This defendant further answering says, that by reason of amendments, disclaimers, and arguments filed during the pendency of the application for said letters-patent, said letters-patent in suit is, if valid at all, restricted and limited in scope to apparatus which is not now and has not been employed by defendant. 20

X.

Defendant avers, on information and belief, that for the purpose of deceiving the public the description and specification filed in the Patent Office in connection with the application for said letters-patent and now forming a part of the letters-patent itself, was made to contain less than the whole truth relative to the alleged invention or discovery, and that for this reason said letters-patent is null and void. 30

XI.

Defendant avers, on information and belief, that the apparatus or alleged invention set forth in said letters-patent is inoperative and incapable of producing any useful result whatsoever.

XII.

Defendant avers on information and belief that 40

the alleged invention of said letters-patent No. 683,676 was abandoned to the public prior to the grant of the patent.

Wherefore, and for the causes aforesaid, this defendant wholly denies the equity of complainant's bill herein, and all manner of wrongful and unlawful acts wherewith in the said bill of complaint it is charged, and, further denies the right of the complainant to the relief, and each and every part thereof, alleged against this defendant in said bill of complaint, and submits it should not be compelled to make any other or further answer than that herein contained.

All of which matters and things this defendant is ready and willing to aver, maintain and prove as this Honorable Court shall direct; and said defendant prays the same benefits from this answer as if it had demurred to the said bill where a demurrer would have been proper, and pleaded to the said bill where a plea would have been proper, and humbly prays to be hence dismissed with its reasonable costs and charges in this behalf most wrongfully sustained.

AMERICAN GRAPHOPHONE COMPANY,

By E. D. EASTON,  
President.

ATTEST:

E. O. ROCKWOOD,  
Secretary.

[SEAL]

PHILIP MAURO,  
C. A. L. MASSIE,  
Of Counsel for Defendant.



STATE OF NEW YORK, }  
CITY OF NEW YORK. } ss.

EDWARD D. EASTON, being duly sworn, deposes and says that he is of lawful age, is a resident of New York City, and is President of the American Graphophone Company, the defendant named in the bill of complaint herein; that he has read the foregoing answer subscribed by him as President of the defendant company and knows the contents thereof; that the same is true of his own knowledge, except as to those matters alleged to be stated on information and belief, and as to those matters he believes it to be true. 10

EDWARD D. EASTON.

Subscribed and sworn to before me  
this 28th day of July, 1904.

ELISHA K. CAMP,  
Notary Public New York County.

[SEAL]

UNITED STATES CIRCUIT COURT.

Southern District of West Virginia.

NATIONAL PHONOGRAPH COMPANY,	} In Equity.	30
vs.		
AMERICAN GRAPHOPHONE COMPANY.	} On Letters Patent No. 683,676.	

**REPLICATION.**

The replication of the above-named complainant to the answer of the above-named respondent:

The repliant, saving and reserving unto itself now, and at all times hereafter, all and all manner 40

of advantage of exception to the manifold insufficiencies of said answer, for replication thereunto, says that it will aver and prove its said bill to be true, certain and sufficient in the law to be answered unto, and that the said answer of the respondent is uncertain, untrue and insufficient to be replied unto by the repliant, without this, than any other matter or thing whatsoever, in the said answer contained, material and effectual in the law, to be replied unto, confessed and avoided, traversed or denied, is true; all which matters and things the repliant is now and will be ready to aver and prove as this Honorable Court shall direct and humbly prays as in and by its said bill it has already prayed.

10

Dated Wheeling, West Virginia, August 30, 1905.

HENRY M. RUSSELL,  
Solicitor for Complainant.

20

# UNITED STATES CIRCUIT COURT.

Southern District of West Virginia.

NATIONAL PHONOGRAPH COM-  
PANY,

*vs.*

AMERICAN GRAPHOPHONE COM-  
PANY:

In Equity, on  
Patent No. 683,-  
676 (Apparatus).

30

Testimony taken on behalf of complainant pursuant to notice before John F. Randolph, Esq., a Notary Public for the State of New Jersey and Special Examiner by consent, at the Edison Laboratory, Orange, New Jersey, this first day of November, 1905.

Present:

FRANK L. DYER, Esq., for complainant.

40

PHILIP MAURO, Esq., for defendant.



Complainant's counsel offers in evidence a certified copy of Letters Patent No. 683,676, granted October 1, 1901, to complainant, as assignee of Walter H. Miller and J. W. Aylsworth, and the same is marked "Complainant's Exhibit Patent in Suit."

It is hereby stipulated and agreed by counsel that any testimony taken by either party in this cause, and any paper exhibits introduced in connection therewith, may be used in the companion suit on method patent No. 683,615, with the same force and effect as if regularly taken and introduced therein, and that in making up the record for the latter suit, any testimony or paper exhibits taken or introduced in this cause may be printed or reproduced as a part of such record. It is also stipulated and agreed that any model or apparatus exhibits introduced by either side in this cause may be used at the hearing of the companion suit with the same force and effect as if regularly introduced therein.

It is further agreed that printed copies of United States patents and blue-book copies of British patents may be used by either side with the same force and effect as if regularly certified, subject, however, to correction in case of error.

Counsel for defendant admits that complainant is a New Jersey corporation, and was incorporated January 27th, 1896, and has since continuously maintained its corporate existence.

Counsel for defendant also admits that the entire title in the patent in suit is owned exclusively by complainant.

PETER WEBER, a witness produced on behalf of complainant, being duly sworn, testified as follows:

10

20

30

40

Direct examination by Mr. DYER:

Q. 1. Please give your name, age, residence and occupation?

A. Peter Weber, age 45 years, residence 46 Ridge street, Orange, New Jersey, and my occupation is Superintendent of the Edison Phonograph Works and other Edison Companies.

10 Q. 2. Did you ever visit the factory of the American Graphophone Company, defendant herein, at Bridgeport, Connecticut?

A. Yes, I did.

Q. 3. When?

A. The latter part of March or first part of April, 1905.

Q. 4. How did you happen to visit defendant's factory?

20 A. Upon the invitation of the Wile Power Gas Company—I think that is the proper name—to look over their gas producer apparatus, which they were installing at the American Graphophone Company's plant at Bridgeport. I met a representative of the Wile Company by appointment at the Grand Central Station, New York; also Mr. King, sales manager of the Nash Gas Engine Company, who was also invited by the Wile Company to inspect this plant and see the working of the apparatus. On our arrival at Bridgeport the man  
30 who installed the gas plant, met us at the gate and showed us the apparatus, which was located adjacent to the power station. As soon as the apparatus on the outside was explained, we went into the wax room, where a kettle was heated by a burner connected with this apparatus. As I remember, this wax room was on the third floor of the building, and on our way down we passed through the record molding room, where I took  
40 notice of the method of molding records.



EDGING MACHINES

AIR PIPE

RECORD TRAY



COOLING SHELF

RECORD TRAY

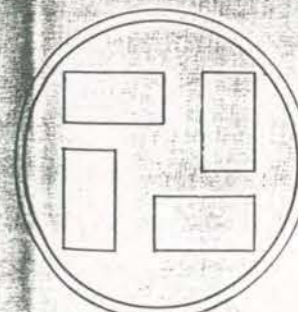
TABLE

TABLE

WATER TANKS

WATER TANK

WAX KETTLE



WAX KETTLE

United States Circuit Court  
Southern District of  
West Virginia

National Phono Co. }  
vs } In Equity.  
American Graph. Co. }

Complainants Exhibit  
Defendants Apparatus Drawing  
No. 1

LAYOUT OF RECORD ROOM

SCALE -  $\frac{1}{2}$ " = 1 ft.

NATIONAL PHONOGRAPH CO.



Q. 5. What kind of records were these?

A. Regular cylindrical sound records.

Q. 6. Did you see the actual manufacture of these records?

A. Yes.

Q. 7. Can you produce a drawing showing the apparatus which you saw in use in the molding room of the defendant company at the time of your visit, and employed in connection with the manufacture of cylindrical sound records?

10

A. Yes, I produce two drawings, made under my directions sometime after my visit to defendant's plant. The first of these drawings is a plan view, showing the general layout as I remember it, of one unit in defendant's factory, and the second drawing shows the tray with molds attached and a reaming knife, as I saw it used.

The drawings referred to are offered in evidence and marked "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 1," and "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 2."

20

Q. 8. Please take these two drawings which you have produced and describe in detail defendant's apparatus as examined by you at the time of your visit, and the process used by defendant in making sound records?

A. Referring first to drawing No. 1, A represents a kettle containing the record composition in the molten state and heated by gas. B are four trays, each of which carrying, I think, eight molds, from which the records are made. These molds are immersed below the surface of the molten material. C, C are two water tanks containing water for cooling the mold. D is a table on which the trays were placed after being lifted out of the water tank. E is a table on which the edging machines for trimming the ends of the record were

30

40



located, and having a shelf F below it, over which cold air was blown from a perforated pipe G, so as to cool the mold sufficient to allow the records to contract away from the mold. H are the edging machines on the table E. I represents a tray having eight molds with records therein, being cooled by air from the pipe G.

10 Referring to drawing No. 2, J represents a tray having a handle K and carrying the molds L for molding the record surface of the duplicate sound records. M is a spindle secured to the tray J and located centrally within each mold. This spindle acts as a guide for a reaming tool N for boring out the interior of the record and forming the concentric ribs therein. This boring tool was turned by a handle O and was provided with a pivoted knife P, operated by a small handle Q, and adapted to be  
20 swung outwardly to engage the material of the composition after the tool was inserted over the spindle M.

The operation of making duplicate sound records in defendant's factory at the time of my visit was as follows:

30 One of the trays with the molds was introduced within the kettle A and the molds immersed beneath the surface of the molten material, which flowed over the top of the molds so as to fill them. The tray and molds were thus immersed in the molten composition for several minutes. When the tray was removed another tray was introduced in the kettle, so that there was always one or more trays continuously immersed in the molten composition. Upon removing the tray from the kettle A, it was put in the water tank C, and the water allowed to surround the molds, but not to overflow them. This  
40 resulted in chilling the material, so as to set it sufficiently to permit the boring operation to be

performed. The tray was then taken out of the water tank C and the boring tool N slipped over the spindle M of each mold. The knife P was then swung to its outer position (shown in drawing No. 2) and the boring tool rotated several times, so as to ream out the bore of the duplicate record, the latter being still in the mold, and formed a series of concentric ribs on its interior. When all the duplicates in the mold of the tray had thus been reamed out on their bores, they were passed over to the cooling and edging table and placed on the shelf F and subjected to a blast of air until the material was cooled sufficiently to result in the records shrinking away from the molds so as to permit them to be taken out. The records, after being thus removed from the molds, were successively placed on edging machines H, and their ends cut off smooth. This operation also defining the correct length of the record.

Q. 9. Did you ever have made an apparatus such as you saw in operation at defendant's factory?

A. Yes, I have had an apparatus similar made, showing one mold and produce the same, together with the reaming tool.

The mold and reaming tool produced by the witness are offered in evidence in the companion suit on Process Patent No. 683,615, and marked "Complainant's Exhibit, Weber's Reproduction of Defendant's Mold," and "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool."

Q. 10. I observe that a core is used which is seated on the spindle in the exhibit mold, and that such a core is not shown in the drawings of defendant's apparatus produced by you. What is the object of this core, and did you see it in use with defendant's apparatus?



A. The object is to leave a space between the spindle and the composition for the introduction of the reaming tool. I did not see this core in defendant's apparatus, as I had no time to examine it in detail. In my opinion, however, there must have been a core, but I did not see it.

Cross-examination by Mr. MAURO:

10 x-Q. 11. During your visit to the factory of the Graphophone Company did you converse with any of the employees of that Company?

A. No.

x-Q. 12. Of whom did you ask questions in the molding room?

A. I did not ask any questions.

x-Q. 13. You said a while ago, if I am not mistaken, that you asked how long the tray of molds remained in the melted wax, and were told, five minutes. Is that so?

20 A. I had taken out my watch, when the gong sounded, to find out how long the mold could be immersed in the wax composition, when the representative of the gas company asked me what I was timing. I told him I wanted to know how long the mold remained in the composition, and he told me, five minutes.

x-Q. 14. Did you inform any employee of the Graphophone Company that you were the superintendent of the Edison Phonograph Works?

30 A. I had no opportunity, I did not come in contact with any of the employees or officers of the company.

x-Q. 15. How did you come to go into the molding room—who suggested your going in there?

A. I do not remember anybody suggesting it, as I remember I simply followed the representative of the gas company through the room.

40 x-Q. 16. Your recollection is that in order to get to the room where the gas burner was, you had to

pass through the molding room. Is that it?

A. Yes, as I remember we entered the room through the yard and walked through it and went up a stairway to the upper floor.

x-Q. 17. In your direct examination, you stated that "on our way down we passed through the record molding room." Do you now wish to say that you went through the molding room both going and coming?

10

A. Yes.

x-Q. 18. How long altogether were you in the molding room?

A. I stopped at one end possibly two or three minutes, and what made me stop was that some gentleman, apparently the superintendent or foreman of the works, stopped the gas company's representative to talk with him. I passed on a few steps and waited for them.

x-Q. 19. How long after that visit did you make a drawing to show your recollection of what you observed there?

20

A. I believe within a week or two I made just a rough sketch and gave explanations here to our man to make the sample mold. (Witness refers to "Complainant's Exhibit, Weber's Reproduction of Defendant's Mold," and "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool," offered in evidence in the companion suit on Process Patent No. 683,615.)

30

x-Q. 20. Did that rough sketch show substantially what is shown by the blueprint drawing you have described today?

A. Yes.

x-Q. 21. At whose request was that drawing made?

A. By no one's request; I wanted to see for my own satisfaction how this molding scheme worked.

x-Q. 22. To whom first and when, did you de-

40



scribe your observations in the molding room of the American Graphophone Company?

A. It may have been Mr. Aiken, my assistant, but I know I told Mr. Edison within a day or two after my visit.

x-Q. 23. Did Mr. Edison know of your proposed visit?

A. No, he did not know.

10 x-Q. 24. You have spoken of a reaming operation which you observed in the molding room of the Graphophone Company; was there anything about that operation different from ordinary reaming operations with which you are familiar?

A. Yes, in that the reaming was done by hand.

x-Q. 25. When the mold was in the wax composition in the tank, were both sides of the mold in contact with melted wax?

20 A. That, I did not see, I was not near enough to the kettle.

x-Q. 26. Did the mold have any means for preventing contact of the outside with the melted wax?

A. After the molds came out of the water tanks I saw them, but did not see them before.

x-Q. 27. In your answer to Q. 8, you said "these molds were immersed below the surface of the molten material," do you wish now to say that you did not see that?

30 A. I did not see them, but I think they were, as I felt underneath the mold, they had a solid bottom, so that no wax could enter underneath them, and the wax must have entered from the top.

x-Q. 28. Can you not also infer that the outside of the mold must have been in contact with the melted composition during the time the mold was immersed therein?

40 A. From the experience I have had in the manufacture of records I would infer that the composition would have to be in contact with the outside

of the mold, in order to bring it up to or near the temperature of the composition.

x-Q. 29. Do you know what that temperature was, or about what it was?

A. No, I do not recollect, but I asked that question of the gas company's representative after we had left the room, and I know from his answer that the temperature was considerably above 300 degrees F.

10

x-Q. 30. You understood that it was considerably above the melting point of the composition?

A. Yes, the reason I remember that it was above 300, was because 300 was above the temperature that we use, and it was above that.

x-Q. 31. The temperature that you use is such that after the mold is immersed in the composition the latter congeals on the inner surface of the mold. Is that correct?

A. Yes.

20

x-Q. 32. In the operation that you saw at the Graphophone factory, did the material congeal on the surface of the mold, or was it in a fluid state in the mold when the latter was taken out of the kettle?

A. I did not see it at that time, I saw it after it came out of the water.

x-Q. 33. I suppose you would say, as a matter of inference, that it must have been fluid, would you not?

30

A. Yes.

Re-direct examination by Mr. DYER:

Rd-Q. 34. You spoke of the reaming operation which was performed on defendant's record while the latter was still in the mold and before the cold air treatment to separate the record from the mold. In performing reaming operations on cast articles in general, for instance, an iron casting, is it the custom to ream the articles while in the

40



molds or after they have been taken out of the molds?

A. We have always reamed them while in the mold.

Rd-Q. 34. Do you now refer to complainant's sound records?

A. Yes.

10 Rd-Q. 36. You did not exactly understand the question. Leaving out of consideration the manufacture of sound records, I ask if in other arts, for instance in finishing a cast steam engine cylinder, or any other cast article, is it the custom generally to ream out the article while still in the mold, or after the article has been taken out of the mold?

A. Invariably, I have never heard of any instance but that a casting is reamed after it is taken out of the mold.

20

Signature and certificate waived.

IN THE UNITED STATES CIRCUIT COURT.

For the Southern District of West Virginia.

<p>30 NATIONAL PHONOGRAPH COMPANY,</p>	<p><i>Complainant,</i></p> <p><i>vs.</i></p>	<p>AMERICAN GRAPHOPHONE COMPANY,</p>	<p><i>Defendant.</i></p>	<p>In Equity. On Letters Patent No. 683,676.</p>
--	--	--------------------------------------	--------------------------	--

40 The testimony taken on behalf of complainant, pursuant to notice, before Edwin S. Clarkson, Esquire, Notary Public in and for the District of Columbia, as special examiner by consent, at the office of Bacon & Milans, No. 908 G Street, North-

west, Washington, D. C., commencing the twenty-second day of January, 1906.

Present:

MR. FRANK L. DYER, for complainant.

MR. PHILIP MAURO, for defendant.

It is hereby admitted by counsel for defendant that subsequent to the first day of October, 1901, and prior to the filing of the bill of complaint herein, the defendant, at its factory in Bridgeport, Connecticut, made use of devices or apparatus for duplicating phonograph records, substantially like those described in the deposition of Peter Weber, taken on behalf of complainant herein and shown in "Complainant's Exhibition, Defendant's Apparatus, Drawing No. 1," "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 2," "Complainant's Exhibit, Weber's Reproduction of Defendant's Mold," and "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool."

That in operating with such devices or apparatus within the time stated, the defendant proceeded as follows:

The material used by defendant in the manufacture of its duplicate records was a wax-like material or composition. This composition was maintained in the wax kettle at a temperature of about 350 degrees F. A tray containing eight molds, each carrying the negative representation of a sound record on its bore, was now immersed below the surface of the molten composition, so that the composition flowed into the molds over the tops thereof, filling the space between each mold and its core. This immersion was continued for about five minutes. The tray was then removed from the

10

20

30

40



wax kettle, carrying the molds filled with the composition in a molten state, and the molds were then immersed in cold water, so as to chill the material to a temperature of about 150 degrees F. At this temperature the material, while still tightly engaging the mold, was relatively soft and plastic. The core was then removed from each mold, leaving a layer of congealed material adhering to the bore and the reaming tool was then introduced so as to remove the surplus material and to form a plurality of concentric ribs on the interior of the duplicate record, said ribs being of gradually increasing depth. The molds were then subjected to a blast of cold air, so as to further reduce the temperature of the duplicate records. In consequence of the cooling of the records, a diametric contraction thereof takes place, so as to permit their withdrawal from the mold. The molds were in some cases provided with detachable bottom plates screwed thereto, said plates bearing raised characters constituting a descriptive title of the record, so that an impression of the characters on said plate was made in the end of the record during the process of molding the latter. After the records had been removed from the molds, the material was cut off at the unfinished end, so as to result in the production of a record of the desired length, and the records were then finished for the market.

L. SEWARD BACON, a witness produced on behalf of the complainant, being first duly sworn, testifies as follows:

Direct examination by Mr. DYER:

Q. 1. What is your name, age, residence and occupation?

A. L. Seward Bacon, 45; Washington, D. C.; solicitor and expert in patent matters and causes. I am also an attorney at law.

Q. 2. What experience have you had which would tend to qualify you as an expert in a suit involving as its subject-matter the question of infringement and the interpretation or meaning of United States Letters Patent?

A. I have been engaged in my present profession for the past fifteen years, during which time I have frequently been called on to testify as an expert in patent causes pending before the United States courts. During my experience as a solicitor of patents I have prosecuted a great many applications for patents, have been constantly required to investigate inventions, patents and publications dealing with the useful arts, and in considering such matters have necessarily been required to ascertain, determine and point out differences in processes, compositions, and articles of manufacture. I have frequently been called on to explain with definite exactness mechanical structures, and to point out concisely and specifically functional and mechanical advantages possessed by structures, methods, etc., over the prior state of the art. In fact, I may say that for fifteen years past I have been constantly employed in the matter of expert considerations of inventions, and in comparing inventions with other inventions of the prior art. During my experience I have very often been called on to express my opinion as to the meaning of language employed in United States patents, and as to the definition of inventions or supposed inventions described in specifications of patents. I have also often been called on to express my opinion as to the question of infringement by structures, methods, etc., of claims of United States Letters Patent, pointing out similarities and as far as possible the relative difference between inventions defined and other or analogous inventions in methods, etc.

10

20

30

40



Q. 3. Have you read and do you understand the invention disclosed and set out in United States Letters Patent No. 683,676, issued to Walter Henry Miller and Jonas Walter Aylsworth, assignors to the National Phonograph Company, dated October 1st, 1901, for "Apparatus for Duplicating Phonograph Records?" If so, please explain your understanding of the invention therein disclosed; and in considering this matter and giving your explanation also address yourself to the consideration of claims 5, 6 and 7 of the said patent, stating your understanding of the meaning of the said claims and the invention covered or intended to be defined therein.

A. I have and do. The patent which I have referred to relates, as the title implies, to an "Apparatus for duplicating Phonographic Records." The patentees, as a preliminary statement relative to the purpose of their apparatus, refer specifically to a method or process of duplicating phonographic records as follows:

"Our invention relates to an improved apparatus for duplicating phonographic records. In an application for Letters Patent filed on even date herewith, and numbered serially 25,591, we describe an improved process or method for duplicating phonographic records, which consists in immersing in a bath of molten wax-like coagulable material a matrix or mold which carries on its bore the representation in negative or relief of the record to be duplicated, whereby the molten material will fill the bore of the matrix or mold, but will be excluded from its exterior, the reduced temperature of the matrix or mold relative to the molten material causing the latter to coagulate or chill upon the bore of the matrix until a layer of the desired thickness has been secured, after which the matrix or mold is removed from the bath of molten material and

the bore of the duplicate finished by a reaming-tool, the resulting duplicate being finally removed from the matrix or mold by shrinking."

This statement refers without specific detail, to the method or process of forming phonographic records described in United States Letters Patent No. 683,615, which is the patent in the companion suit in which I have heretofore testified. The patent in the present suit, as I understand it, is directed to an invention in apparatus as distinguished from the said process and its object as stated is "to provide an improved apparatus by which the process in question may be expeditiously carried out."

Referring now to the description and drawings of the patent, I shall avoid quoting at length but will refer briefly to the general characteristic features of the apparatus employed for making a duplicate phonographic record. The apparatus comprises first a cylindrical matrix or mold and which the inventors state "is made by any approved process." This mold or matrix carries on the wall of its bore, the representation of the record which is to be duplicated, the same being in negative or relief. This cylindrical mold or matrix is provided with a cap designated at 2 in the drawing which cap is removably fitted to the upper end of the mold or matrix. The mold is placed on a plate or disk indicated at 3 which has a central opening of a diameter less than the diameter of the interior bore of the mold and on the upper face of the disk between the walls of the bore and the central opening is formed in negative suitable words or characters as indicated at 7, designed to indicate the subject-matter or title of the record, its origin, etc. This representation is presented upwardly, as illustrated in Figure 1 of the drawings. The disk which supports the mold has a handle or bail, the upper portion of which projects over the cap, and when the mold is placed on the disk and properly positioned, the whole is in-

10

20

30

40



serted in a receptacle which is of sheet metal and designated at 8, Figure 1. This receptacle has an opening in its bottom part and is provided with a handle at its upper end. The receptacle serves as a convenient means for handling the mold and provides an air jacket for the outer surface thereof. Below the matrix carrying receptacle or jacket is a tank containing a wax-like coagulable material which is kept in a molten condition by means of a burner or heater shown rather diagrammatically at 12, in Figure 1 of the patent. The size of the kettle or tank 11 containing the wax-like material is sufficient to permit the carrying receptacle to be inserted therein, so that the wax-like molten material will immediately enter the interior of the mold or matrix through the openings in the receptacle and disk and completely immerse the entire record bearing surface of the matrix or mold. This matrix or mold is shown as being somewhat tapered on its outer face and this outer face is prevented from coming into contact with the heated wax-like material by the walls of the receptacle 8 so that said outer face is air jacketed and in contact with the atmosphere, the top of the carrying receptacle, being open. The method of procedure is to immerse the receptacle and its mold or matrix in the body of the molten wax-like material to a depth which brings the level of the material above the top of the mold, but below the top of the cap, so that the material fills the interior of the mold but does not overflow the same. The molten material enters and fills all the minute depressions of the record surface and forms an exact duplicate thereof. Since the temperature of the matrix or mold is below the temperature of the molten material, that portion of the latter which is in contact with the mold or matrix thickens or congeals and in that condition adheres to the mold. This chilling, as the inventors state, "makes the

outer surface of the resulting duplicates much smoother than is the case of duplicates made by mechanical duplicating processes." The wax-like material of course, congeals as soon as its temperature is lowered to the congealing point and as the exterior surface of the mold is surrounded by the relatively cold atmosphere there will be a transfer of heat from the molten material which is nearest the mold to the mold, and from the mold to the atmosphere. The congealed material will therefore gradually increase in thickness owing to this transfer of heat until the deposit of congealed material is of sufficient thickness for the production of a record. As soon as the mold is loaded with a sufficiently thick layer of congealed wax-like material it is taken from the receptacle 8 and placed in a hollow chuck which is indicated at 14 in Figure 2. The said chuck has a central tapered cavity into which the tapering mold or matrix is firmly seated. This chuck 14, the inventors state, is rotated in any suitable way while the congealed wax-like material within the mold is in a solid, and somewhat plastic state. A suitable reaming tool is then inserted and held against the plastic material, whereupon the rotation of the chuck with its mold causes the inner portion of the wax-like cylinder to be pared off or reamed out so as to fit the mandrel of a reproducing machine or phonograph. The reaming, tool is in the form of a knife or cutter having a series of cut-away portions so that a series of concentric ribs are formed on the inner surface of the molded record cylinder. These ribs, the inventors state, should be of different depth, or diameter and to so fashion them an auxiliary cutting blade 17 is carried by the reamer, the same being pivoted at one end and adjustable at the opposite end. This blade extends across the interrupted parts of the reamer proper and serves to cut or pare off the inner por-

10

20

30

40



tions of the ribs. By the adjustment of the ribs may be made to increase in depth at any desired rate so as to properly fit the tapered mandrel of a phonograph. The apparatus comprises means for adjusting the reamer so that the proper amount of material can be removed from the inner surface of the congealed semi-plastic wax-like material constituting the body of the reproduced record cylinder.

10 The chuck 13 is shown and described as being hollow and the inventors state that cold water may be circulated through the hollow interior thereof for the purpose of maintaining the outer surface of the record cylinder in a chilled or hardened condition.

The inventors describe a cooling mold (shown in Figure 3) which has a water jacket through which cold water may be circulated and the mold 1 is inserted therein so that the resultant duplicate may be  
20 "contracted sufficiently to enable it to be removed from the matrix or mold." In the use of the apparatus which I have referred to, the indicating representations or letters on the plate 3 are so positioned that the wax-like material will flow upon and around the same and congeal so as to reproduce said representations on the edge or end of the molded cylinder.

The inventors say that "by reaming the material of the resulting duplicates as explained to form a series of ribs therein the duplicates may be made  
30 much thinner than the ordinary records and hence more economically." They suggest the obvious fact that the material removed by the reaming tool may be again employed for the subsequent manufacturers of duplicates.

In referring to the claims inquired about, I shall take them up in order commencing with claim 5 which is as follows:

40 "An improved apparatus for making duplicate phonographic records, comprising a mat-

rix or mold carrying on its bore the representation of the record to be duplicated, a disc upon which said matrix or mold is seated, said disc carrying concentrically within the bore of the matrix or mold a designation of such record, and means for depositing molten material within the matrix or mold and upon said disc, whereby the duplicate record will be formed and its designation be simultaneously cast or impressed upon the end thereof, substantially as and for the purposes set forth."

10

In this claim I find an invention for the purpose defined which comprises first, a matrix or mold carrying on its bore a representation of the record to be duplicated; second, a disc upon which said matrix or mold is seated, which disc is further defined as carrying concentrically within the bore of the matrix a designation of such record meaning thereby suitable words or character to indicate the subject-matter; its source or origin as referred to in the specification; and third, means for depositing molten material within the matrix or mold and upon the disc. The final clause of the claim is in the nature of an explanatory clause stating the resultant product to be a duplicate record which will have its designation cut or impressed on the end. This claim is directed, in my opinion to an apparatus which comprises the three elements above referred to and is stated in general and comprehensive terms.

20

Claim 6 is stated in the following language:

"An improved apparatus for duplicating phonographic records comprising the combination with means for securing a deposit of a wax-like coagulable material upon the bore of a matrix or mold which carries the representation of the record to be duplicated, of means for finishing the interior of the duplicate while the latter is in position within the matrix or mold, substantially as set forth."

30

This claim comprises as elements in combination, first, means for securing a deposit, of wax-like coag-

40



ulable material upon the bore of the matrix, and second, means for finishing the interior of the duplicate while the latter is in position within the matrix or mold.

The seventh claim is stated in the following language:

10 "An improved apparatus for duplicating phonographic records, comprising the combination with means for securing a deposit of a wax-like, coagulable material upon the bore of a matrix or mold which carries the representation of the record to be duplicated, of means for forming within the duplicate, while the latter is in position in the mold, a series of concentric ribs of gradually increasing diameters from one end of the duplicate to the other, whereby the duplicate may be properly received upon a tapered mandrel, substantially as set forth."

20 and defines an apparatus, which comprises, first, means for securing a deposit of wax-like coagulable material upon the bore or matrix of the mold, and second, means for forming in the duplicate while in position in the mold, a series of concentric ribs which are defined as being of gradually increasing diameter from one end of the duplicate to the other. The claim states the purpose of this as being that the duplicate may be properly received upon a tapered mandrel.

30 Considering these latter claims generally, I do not find any expressed limitations contained therein which would indicate that the inventors intended or desired to limit themselves to the use of the exact apparatus shown. In fact, seemingly the inventors have with marked care avoided the use of limiting term or terms which would confine them to the identical form shown in the patent, as for instance, in the claims, the word "means" is em-

ployed which in my opinion comprehends naturally not only those shown, but other or equivalent means. Claim 5 is drawn, in my opinion, to cover that feature of the apparatus wherein the "designating" feature is made a pronounced element or factor, while in claim 6, the invention defined is directed to those features of the apparatus wherein an apparatus is designed to secure the deposit of a wax-like material within the mold or matrix, and the reaming out or finishing of the interior while in position in the mold. Claim 7, is in some respects similar to claim 6, but more specific in its general definition, including as it does a definition of a reaming tool or device which will in the finishing of the record form concentric ribs of gradually increasing diameters.

10

Q. 4. Have you read the testimony of Peter Weber, in this cause; have you examined the exhibits referred to by him and have you read the admission of defendant's counsel entered on the record relating to the apparatus used by the defendant in making duplicate phonographic records?

20

A. I have.

Q. 5. Do you understand the apparatus employed by the defendant, and described by Mr. Weber, and as admitted by defendant's counsel?

A. I do.

Q. 6. Please compare the apparatus for duplicating phonographic records described by Mr. Weber in his deposition, and as shown in said exhibits and as admitted by defendant's counsel with the invention disclosed with the patent in suit, and especially as defined in claims 5, 6 and 7 thereof, stating thereafter whether or not in your opinion the said apparatus employed by the defendant embodies the invention defined in the said claims of the patent in suit.

30

A. Taking up the defendant's apparatus as de-

40



scribed by Mr. Weber, as shown in the exhibits he has referred to, and as admitted by the defendant's counsel, I find that the defendant in making its apparatus has taken first a disc or plate, and secured thereon a record matrix, having on its bore the representation in negative relief of the record to be duplicated, this plate being designated at J in "Complainant's Exhibit No. 2." The plate  
10 also has a handle by which the same can be carried and inserted into and taken from the molten material contained in the kettle or wax-containing receptacle, also into and from the cooling pan. I understand that the wax-like material is kept in a molten condition and that the mold or matrix after being secured to the disc is introduced into the material, the same flowing over the top into the mold and immersing completely the record-bearing surface thereof. I find in "Complainant's  
20 Exhibit, Weber's Reproduction of Defendant's Mold," that this disc or plate is represented by the bottom portion, and I also understand that at the base of the mold a detachable bottom plate is sometimes secured, which plate bears raised characters constituting a descriptive indication of the record. These indicating characters lie within the bore of the mold and face upward. In the defendant's structure or apparatus, a central fixed pin is employed which rises to the upper end of the mold,  
30 said pin being secured to the disc or base plate and in use a core piece is sleeved over this pin so that the molten wax-like material will occupy only the space between the core piece and the record bearing surface of the mold. As I understand the method adopted by the defendant, after the mold has been filled with the molten wax-like material it is removed from the heated mass in the wax kettle and is placed in the cooling bath which  
40 causes the material to be one semi-plastic or con-

gealed. The core piece is then removed and the reaming tool forming a part of the apparatus, being such as shown in "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool," is then slipped over the pin within the mold and the knife or reamer proper is properly adjusted to finish the interior of the record cylinder, the reamer being turned by hand. I also notice that parts of the edge of the cutting knife are cut away and the bases of such cut-away portions are sharpened so that the entire outer edge of the knife itself serves as a cutting edge. I also find that the cut-out portions of the knife gradually increase in depth, so that the resultant product is a phonographic record having a series of concentric ribs of gradually increasing diameter, so that the cylinder will properly fit the tapered mandrel of the phonograph. In the method employed by the defendant, after the bore of article has been finished the mold is subjected to the action of a cooling agent until the record has contracted sufficiently to enable it to be readily removed longitudinally from the mold. Upon comparing the apparatus of the defendant and its use as described by the witness, Weber, and referred to in the admission of counsel for the defendant, with the apparatus of claims 5, 6 and 7, of the patent in suit, I find the two to be in every substantial respect the same. In the first place, I find in both apparatus, a matrix or mold mounted on a disk or base which is inserted in the receptacle containing the heated wax-like material, so that the molten material enters the mold and fills all the minute depressions of the record upon the bore thereof, and also covers the designating representations at the bottom of the mold, so that the same will be cast on the end of the duplicate. While in this position heat is abstracted from the material so that it congeals and becomes plastic, but not

10

20

30

40



brittle or hard. I find also that both apparatus comprehend means for finishing the bore of the record, while in the mold with a series of concentric ribs of gradually increasing diameter from one end to the other. In my opinion, therefore, the apparatus used by the defendant is in all substantial and material respects the same as the apparatus described and claimed in the patent in suit and it is designed for the same purpose, i. e., the production of a phonographic record cylinder of the same kind. It is true that the apparatus employed by the defendant differs in some respects from that of the patent but these differences I do not regard as being material. For instance, in the specific apparatus described in the patent in suit the mold carrying the plastic coagulated wax-like material is rotated with respect to a stationary reamer or rib forming tool, while in the defendant's apparatus the mold is stationary and the tool is rotated; but this is a mere reversal of operation, the same parts performing the same function in substantially the same way. Another difference which I find is that instead of using a mold support having an opening in the bottom as in the patent, the defendant employs a support closed at the bottom and allows the molten material to flow in over the top of the mold. This, however, is immaterial in my opinion, in the consideration of the claims noted since they are not limited to any particular form of mold support.

The deposit upon the bore of the mold in both apparatus is composed of congealed wax-like material. This congealing is brought about by the application of a cooling medium to the exterior surface of the mold for the extraction of heat therefrom, so that there will be a flow of heat from the hot molten material to the mold, and from the mold to the cooling medium. The apparatus shown in

rounding the mold while in defendant's apparatus a water bath is employed for this purpose, but these elements are clearly equivalent. In the apparatus described in the patent, the means for securing the deposit of wax-like material is applied to the mold while in the wax-kettle, while in the defendant's apparatus the means for securing the deposit is applied after the mold has been removed from the kettle, but this fact is immaterial since the claims are not limited in this respect and the principle and mode of operation is substantially the same. In the apparatus of defendant's, a removal core piece is employed, in order that the molten material may be congealed in hollow form, and such piece is dispensed with in the apparatus illustrated in the patent, because in the latter the material at and near the centre of the mold remains at all times in a fluid condition and will therefore escape through the opening in the bottom of the mold when it is lifted out of the kettle. In both forms of apparatus, a hollow shell-like, semiplastic cylinder adhering to the bore of the mold is produced. The bore of such a cylinder can be very readily trimmed or finished because it is soft and easy to cut and the parings have room to escape to the centre. The presence or absence of a core is entirely immaterial, in view of the language of the claims noted, which are not limited in this respect, and because the use of a core does not constitute a departure from the invention, being merely a well-known equivalent means for securing a hollow casting.

Other slight differences might be referred to, but they are wholly unimportant in my opinion. The differences that I have referred to in my opinion do not take the apparatus of the defendant out of the scope of the patent in suit. The two apparatus operate in substantially the same way to produce the same or substantially the same result.



Now, comparing claim 5 with the defendant's apparatus, I find that in defendant's apparatus there is first a matrix or mold carrying on its bore a representation of the record to be duplicated. I also find "a disk" which is the base plate of the defendant's apparatus, as shown in the blue print Exhibit No. 2, and also to be found in "Complainant's Exhibit, Weber's Reproduction of Defendant's Mold." I also find that the said disk carries concentrically within the bore of the matrix or mold a designation of such record. This is admitted in the admission of defendant's counsel in the following language:

"The molds were in some cases provided with detachable bottom plates screwed thereto, said plates bearing raised characters constituting a descriptive title of the record, so that an impression of the characters on said plate was made in the end of the record during the process of molding the latter."

Now although this admission does not refer to a *concentric* arrangement of the characters which constitute the designation which is to be impressed upon the end of the record, it must be inferred, I think, that the arrangement is concentric, because the admission states that the impression of the characters on the plate was made in the *end* of the record during the process of molding, and as the record is a thin hollow cylinder, the arrangement could not be other than concentric.

Finally, there is clearly in the defendant's apparatus means for depositing molten material within the mold and upon the disk for the purpose of forming a duplicate record having its designation impressed on the end thereof, that is, means whereby the mold is rendered cooler than the contacting molten coagulable wax-like material. In

the defendant's structure a water tank is employed into which the mold is plunged. This cools the mold and the adjoining wax-like material so as to cause the latter to congeal while in contact with the bore of the mold. In the structure shown in the patent the outer surface of the mold is exposed to the atmosphere while its bore is in contact with the wax-like material. Heat therefore passes from the material to the mold, and from the mold to the surrounding air. This abstraction of heat causes the material to congeal and form a deposit upon the bore of the mold and upon the disk. In both structures the mode of operation of these elements of the combination claimed is identical. It is clearly immaterial whether a water bath or an air bath be employed as the cooling agent.

10

In my opinion therefore, defendant's apparatus embodies the invention defined by the fifth claim.

20

Claim 6, as I have heretofore stated, defines an the patent comprises an air jacket or air bath, sur-apparatus comprising in combination means for securing a deposit of wax-like coagulable material upon the bore of the matrix or mold, etc., with means for finishing the inferior of the duplicate, while the latter is in position within the matrix or mold. I have already explained in my consideration of claim 5 the means employed by defendant for securing a deposit of wax-like coagulable material upon the bore of the mold, said means in my opinion being the full equivalent of that of the patent in suit, as broadly stated in the sixth claim.

30

I find that the defendant's apparatus embodies means for finishing the interior of the duplicate, while the latter is in position within the mold, and comprising the reaming tool which is supported upon the central pin within the mold and is rotated so that the cutting edge operates upon the plastic coagulated material and finishes the interior

40



thereof. The claim does not state, and it is immaterial, whether the mold moves and the tool is fixed or the tool is moved and the mold is fixed. The claim simply refers to any means for finishing the interior of the duplicate while the latter is in position in the matrix or mold, and in my opinion, the invention thereof is fully embodied in defendant's apparatus.

10 Now, in referring to claim 7, this covers an apparatus comprising means for securing a deposit of wax-like coagulable material upon the bore of the matrix or mold and what I have said in relation to claim 5 relative to this particular element is directly applicable to claim 7. Claim 7 recites as the second element of the combination "means for forming within the duplicate (meaning the coagulated deposit in the mold or matrix) while the latter is in position in the mold, a series of concentric ribs of gradually-increasing diameters from one end of the duplicate to the other." The defendant's reaming tool answers this exactly. It is designed and used for this particular purpose. The variations in the depth of the grooves of the cutting edge in the reamer of defendant's manufacture results in the formation of ribs of increasing diameters. In my opinion, therefore, defendant's apparatus embodies the invention defined by this claim.

20  
30 Making a general answer to your question, therefore, I am of the opinion that the apparatus employed by the defendant is the apparatus in every material and substantial respect or at least an equivalent apparatus to that of the patent in suit as defined particularly in claims 5, 6 and 7, thereof; that the several elements stated in the combinations of these claims are substantially the same in the patent and in the defendant's apparatus; that the two apparatus operate in the same manner to produce the same result. The article produced by  
40

the apparatus described in the patent and that produced by the apparatus used by the defendant are exactly the same, namely, a duplicate molded phonographic record in the form of a hollow cylindrical shell of substantially uniform thickness, having in its bore a series of concentric ribs of gradually increasing depth having designations on one end and having a smooth and perfect record surface. In fact I am familiar with the commercial duplicate records made by the defendant and also by the complainant and they are so nearly alike as to be practically indistinguishable, excepting only for the distinctive markings on the end of the records which markings show its origin as well as the name of the piece recorded. 10

I am clearly of the opinion that whatever differences may exist in the structural parts of the apparatus of the defendant and that described in the patent in suit, and covered by claims 5, 6 and 7 thereof are merely colorable and do not in any wise effect the identity of the two apparatus, their mode of operation, their object and their result. 20

Met pursuant to adjournment this 30th day of October, 1906, at the offices of Bacon & Milans, 908 G Street, N. W., Washington, D. C.

Parties present as before.

Cross examination of Mr. Bacon by Mr. MAURO: 30

x-Q. 7. The claims in suit call for "means for depositing molten material within the matrix or mold." What are those means?

A. The term appearing in claim 5 is "and means for depositing the molten material within the matrix or mold" while claim 6 is somewhat different in that it states "means for securing a deposit of wax-like coagulable material upon the bore of the matrix or mold," which expression is also used in claim 40



7. The means referred to in the three claims, in my opinion, relate and include that part of the apparatus shown in the patent which is characterized by the construction illustrated in Figure 1, especially the tray part which is employed for dipping purposes. The term is rather comprehensive and broad, as I have heretofore stated, including any means for effecting that result, namely of  
10 depositing the molten material within the matrix and also causing the material to be deposited. Stated in other language, it can very properly be said to mean, means whereby the molten material can be deposited in the mold. This is especially with reference to claim 5. As to claims 6 and 7, which recites the means as being such as to secure a deposit upon the bore of the mold, the term is predicted in my judgment on that feature of the apparatus which renders the mold sufficiently cool  
20 to create a cause of congealing of the material on the bore of the mold. The means in the apparatus of the patent consists in the feature whereby the mold is held within the cooling influence of the air contained in what the inventors term the receptacle 8.

x-Q. 8. The word "means" refers to certain definite parts of the apparatus, doesn't it?

A. Yes.

30 x-Q. 9. Then can you not without ambiguity and prolixity tell us what those parts are?

A. In the fifth claim, as I have stated, the "means" relate to the tray holder, while in the sixth and seventh claims the "means" relate to the carrier or receptacle, but in this connection my understanding is that the terms are sufficiently comprehensive to include other means for producing the same result.

40 x-Q. 10. Does the receptacle form any part in securing the deposit?

A. It is the means whereby the mold is cooled or kept cool so that the deposit will form, it is not in itself perform a physical act.

x-Q. 11. Does the temperature of the mold perform any part in securing the deposit?

A. Certainly, when that temperature is maintained, as I understand it, by the surrounding air.

x-Q. 12. What must that temperature be relative to the temperature of the melted material? 10

A. I could not state in degrees but it must be below the temperature of the melted material.

x-Q. 13. Does the cap perform any part in securing the deposit?

A. I do not think it performs any important part in that respect.

x-Q. 14. Does the open bottom of the mold perform any part in securing the deposit?

A. I do not think so. That is a means whereby the material is permitted to enter the mold. 20

Cross examination closed.

Signatures and certificates waived.

Counsel for complainant announces the closing of his *prima facie* case.

30

40



UNITED STATES CIRCUIT COURT.

Southern District of West Virginia.

10	NEW JERSEY PATENT COM- PANY,	} In Equity. On Letters Patent No. 831,668.
	<i>Complainant.</i>	
	<i>vs.</i>	
	AMERICAN GRAPHOPHONE COM- PANY,	
	<i>Defendant.</i>	

**BILL OF COMPLAINT.**

20      *To the Honorable the Judges of the United States  
Circuit Court for the Southern District of  
West Virginia:*

30      NEW JERSEY PATENT COMPANY, a corporation  
created, organized and existing under and by  
virtue of the laws of the State of New Jersey  
and having its principal office at West Orange,  
County of Essex, in said State, brings this, its bill  
of complaint against American Graphophone Com-  
pany, a corporation organized and existing under  
and by virtue of the laws of the State of West Vir-  
ginia, and a resident and inhabitant of said South-  
ern District of West Virginia.

And thereupon your orator complains and says:

40      1. That heretofore and before the 13th day of  
October, 1897, Maurice Joyce, being then a citizen  
of the United States, was the original, first and sole  
inventor of a certain new and useful improvement  
in methods of duplicating phonograms, fully de-  
scribed in the Letters Patent hereinafter men-  
tioned, and which had not been known or used by

others in this country before his invention or discovery thereof, and which had not been patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, and which had not been in public use or on sale in the United States for more than two years prior to his said application, and which had not been abandoned to the public; that on the 13th day of October, 1897, the said Maurice Joyce being as aforesaid the original, first and sole inventor or discoverer of the said improved method, made application in writing to the Commissioner of Patents of the United States for the grant of Letters Patent therefor, and paid into the Treasury of the United States the fees required by law and then and there fully and in all respects complied with all the necessary conditions and requirements of the statutes of the United States in such case made and provided.

2. That on or about the 10th day of October, 1902, and before the issuance of Letters Patent on said improvement, the said Maurice Joyce, for a valuable consideration, by an instrument in writing, duly signed and delivered, and afterwards recorded in the United States Patent Office, did sell, assign and transfer to the National Phonograph Company, a corporation organized and existing under and by virtue of the laws of the State of New Jersey, its successors or assigns, the entire right, title and interest in and to the aforesaid invention and in and to any Letters Patent of the United States which might be granted therefor, as by said assignment, or the legal evidence thereof, here in court ready to be produced, will more fully and at large appear.

3. That on or about the 22nd day of July, 1904, and before the issuance of Letters Patent on said



improvement, said National Phonograph Company, for a valuable consideration, by an instrument in writing, duly signed and delivered, and afterwards recorded in the United States Patent Office, did sell, assign and transfer to your orator, New Jersey Patent Company, its successors and assigns, the entire right, title and interest in and to the afore-  
10 said invention and in and to any Letters Patent of the United States which might be granted therefor, as by said assignment or the legal evidence thereof, here in court ready to be produced, will more fully and at large appear.

4. That due and legal proceedings were had on said application for Letters Patent for the invention of said improved method and that the Commissioner of Patents thereafter caused to be issued to your orator, New Jersey Patent Company, Letters  
20 Patent in due form of law, under the seal of the Patent Office of the United States, signed by the Commissioner of Patents, bearing date the 25th day of September, 1906, and numbered 831,668; and that said Letters Patent did grant unto your orator and unto its successors and assigns for the term of seventeen years from the date thereof, the exclusive right to make, use and vend the said invention throughout the United States and the territories thereof, as by reference to said Letters Patent or a  
30 duly authenticated copy thereof ready in court to be produced will more fully and at large appear.

5. That ever since the grant thereof your orator has been, and still is the sole and exclusive owner of the said Letters Patent No. 831,668, and has been and is now entitled to all damages and profits for infringement and violation thereof.

6. That the defendant well knowing the premises and the rights secured to your orator as afore-  
40 said, but contriving to injure your orator and to

deprive it of the benefits and advantages which might and otherwise would accrue unto your orator from the said invention, after the grant of said Letters Patent No. 831,668 and before the commencement of this suit, within the District of Connecticut and elsewhere in the United States, without license or allowance, and against the will and protest of your orator and in violation of its rights, did unlawfully and wrongfully use, or cause to be used, and is now using, or causing to be used, the said improved method of duplicating phonograms, as set forth and claimed in the Letters Patent aforesaid, and did use or cause to be used, as aforesaid, the said invention in the manufacture of phonograms; that said defendant still continues so to do, and that it threatens to continue the aforesaid unlawful acts to a large extent, all in defiance of the rights secured to your orator as aforesaid and to its great and irreparable loss and injury, and by which your orator has been and still is being deprived of great gains and profits which it might and otherwise would have obtained, but which have been received and enjoyed by the said defendant, through its said unlawful acts and doings; and your orator further shows that it has caused notice to be given to said defendant of said infringement and of the rights of your orator in the premises and requested defendant to desist and refrain therefrom, but the said defendant disregarded said notice and refused to desist from said infringements, and still continues to employ the improved method embodying said invention in the manufacture of phonograms; and your orator further shows that as to the number of phonograms, which have been by the defendant, as aforesaid, unlawfully made, and as to the extent of the gains and profits received and enjoyed by the said defendant from such unlawful making, your orator is ignorant, and prays a discovery thereof.

10

20

30

40



7. That the manufacture of phonograms by the employment of the invention set forth in the Letters Patent aforesaid, by the defendant, and its preparation for and avowed determination to continue the same in disregard and defiance of the rights of your orator have the effect to encourage and induce others to venture to infringe said Letters Patent.

8. And your orator therefore prays as follows:

10 That the defendant may be required by a decree of this Honorable Court to account for and pay over to your orator such gains and profits as have accrued or arisen, or been earned or received by the said defendant by reason of the said unlawful doings, and all such gains and profits as would have accrued to your orator but for the unlawful doings of said defendant, and all damages your orator has sustained thereby, and that the Court may assess said profits and damages and may increase the damages to a sum not exceeding three times the amount thereof.

20 That the said defendant, American Graphophone Company, and its officers, servants, agents, attorneys, employees, workmen and confederates, and each and every of them may be perpetually restrained and enjoined by the order and injunction of this Honorable Court, from directly or indirectly  
30 employing the invention of the Letters Patent aforesaid in the manufacture of phonograms, or from any or further infringement upon or violation of the said Letters Patent in any way whatsoever, and that defendant be ordered to deliver to your orator or to an officer of this Court, for destruction, all molds and other apparatus used by the said defendant in the carrying on of said method covered by the Letters Patent aforesaid, and that the said defendant may be decreed to pay the costs of this  
40 suit; and

• That your orator may have such other and further relief as to this Honorable Court shall seem meet and as shall be agreeable to equity.

To the end therefore, that the said defendant may, if he can, show why your orator should not have the relief prayed for, and may full, true and direct answer make, but not under oath (answer under oath being hereby expressly waived), according to the best and utmost of its knowledge, remembrance, and belief, to the several matters hereinbefore averred and set forth, as fully and particularly as if the same were repeated paragraph by paragraph, and the said defendant specifically interrogated, may it please your Honors to grant unto your orator a writ of *subpoena ad respondendum*, issuing out of and under the seal of this Honorable Court, directed to the said defendant, American Graphophone Company, commanding it to appear and make answer to this Bill of Complaint, and to perform and abide by such orders and decrees herein, as to this Court may seem just.

And your orator will ever pray, etc.

HENRY M. RUSSELL,

Solicitor for Complainant.

FRANK L. DYER,

Of Counsel. 30

STATE OF NEW JERSEY, }  
COUNTY OF ESSEX. } ss:

THOMAS A. EDISON, being duly sworn, deposes and says that he is the President of New Jersey Patent Company, the complainant named in the foregoing Bill of Complaint; that he has read the same and knows the contents thereof to be true except as to those matters stated to be alleged on in-



formation and belief, and as to those matters he believes it to be true; that the reason why this verification is not made by the complainant personally is because it is a corporation.

THOMAS A. EDISON.

Subscribed and sworn to before me  
this 11th day of December, 1906.

10 [SEAL] A. WESTEE,  
Notary Public of New Jersey.

IN THE CIRCUIT COURT OF THE UNITED  
STATES.

For the Southern District of West Virginia.

20	NEW JERSEY PATENT COM- PANY,	} In Equity. On Joyce Patent, No. 831,668.
	vs.	
	AMERICAN GRAPHOPHONE COM- PANY,	

*To the Clerk of the above-entitled Court:*

You will please enter our appearance as solicitors for defendant in the above-entitled cause.

30 A. WESTEE,  
Notary Public of New Jersey.

PHILIP MAURO,  
C. A. L. MASSSIE,  
Tribune Building,  
154 Nassau Street,  
New York City.

Dated February 4. 1907.

IN THE CIRCUIT COURT OF THE UNITED  
STATES.

For the Southern District of West Virginia.

NEW JERSEY PATENT COM-  
PANY,  
*vs.*  
AMERICAN GRAPHOPHONE COM-  
PANY,

In Equity. On 10  
Joyce Patent,  
No. 831,668.

ANSWER.

The answer of the American Graphophone Com-  
pany to the Bill of Complainant of New Jersey  
Patent Company.

THE AMERICAN GRAPHOPHONE COMPANY, a cor- 20  
poration created, organized and existing under and  
by virtue of the laws of the State of West Virginia,  
and a resident and inhabitant of the said State and  
of this District now and at all times hereafter, sav-  
ing and reserving unto itself all and all manner  
of advantage of exception which can or may be had  
or taken to the many errors, uncertainties, insuf-  
ficiencies, and other imperfections in the said com-  
plainant's bill of complaint, for answer thereto or  
to so much and such parts thereof as it is advised 30  
are material or necessary to make answer unto,  
answering says:

That as to whether the complainant is a corpor-  
ation as alleged in its bill, this defendant does not  
know and has no information save by said bill, and  
therefore leaves the complainant to make such  
proof thereof as it may be advised is material; but  
this defendant admits that it is a West Virginia  
corporation as above set forth. 40



1. This defendant admits that on September 25, 1906, U. S. Letters-Patent No. 831,668, were issued; but on information and belief this defendant denies that Maurice Joyce was then or at any time the original and first, and sole inventor of the subject-matter set forth in said patent or of any material part thereof; and denies that the same discloses any new or useful improvements in methods of duplicating phonograms; and denies that the same or any material part thereof had not been known or used by others in this country before the alleged invention or discovery thereof by the said Joyce; and this defendant, on information and belief, further denies that the said alleged invention and improvements had not been patented or described in any printed publication in this or any foreign country before his invention or discovery thereof; and further denies that the same had not been in public use or on sale in the United States for more than two years prior to any application made by the said Joyce for U. S. Letters-Patent thereon; and further avers that the same had not been abandoned to the public. This defendant is not advised save by the bill whether or not the said Joyce made application in due form of law for the said patent No. 831,668, or complied with the necessary conditions and requirements of the statutes, and therefore calls on complainant for strict proof thereof.

2. This defendant has no information with regard to the allegations in paragraph 2 of the bill save by the bill itself, and therefore calls on complainant for strict proof thereof.

3. This defendant has no information with regard to the allegations in paragraph 3 of the bill, save by the bill itself, and therefore calls on complainant for strict proof thereof.

4. This defendant admits that on September 25, 1906, U. S. Letters-Patent No. 831,668, were issued; but upon information and belief, this defendant denies that by virtue of the premises any exclusive rights were granted to the complainant, and denies that the complainant has any exclusive rights in the premises.

5. Again denying that complainant has any exclusive rights by virtue of the said Letters Patent No. 831,668, this defendant has no information touching the remaining allegations of paragraph 5 of the bill, save by the bill itself, and therefore calls on complainant for strict proof thereof.

6. This defendant denies each and every allegation in paragraph 6 of the bill.

7. This defendant denies each and every allegation in paragraph 7 of the bill.

8. And without waiving any of the matters and things already set forth herein, and further answering the bill, this defendant upon information and belief, avers that the alleged invention and improvements set forth and claimed in and by the said Joyce patent here in suit were fully anticipated, as to the whole and as to all material parts thereof, by each of the following Letters-Patent of the United States, to-wit:

No. 12,192, Jan. 9, 1855, Casselman;

No. 153,084, July 14, 1874, Joyce;

No. 276,777, May 1, 1883, Cocheu;

No. 281,529, July 17, 1883, Lefferts;

No. 303,970, Aug. 26, 1884, Appelt;

No. 341,212, May 4, 1886, Bell & Tainter;

No. 341,214, May 4, 1886, Bell & Tainter;

No. 341,287, May 4, 1886, Tainter;

No. 341,288, May 4, 1886, Tainter;

No. 356,877, Feb. 1, 1887, Hohenstein;

10

20

30

40



- No. 372,786, Nov. 8, 1887, Berliner;  
No. 375,579, Dec. 27, 1887, Tainter;  
No. 382,417, May 8, 1888, Edison;  
No. 382,419, May 8, 1888, Edison;  
No. 382,790, May 15, 1888, Berliner;  
No. 385,886, July 10, 1888, Tainter;  
No. 385,887, July 10, 1888, Tainter;  
No. 393,463, Nov. 27, 1888, Edison;  
10 No. 393,966, Dec. 4, 1888, Edison;  
No. 393,967, Dec. 4, 1888, Edison;  
No. 399,264, Mar. 12, 1889, Herrington;  
No. 400,649, Apr. 2, 1889, Edison;  
No. 400,650, Apr. 2, 1889, Edison;  
No. 406,576, July 9, 1889, Edison;  
No. 413,282, Oct. 22, 1889, Jacques;  
No. 414,761, Nov. 12, 1889, Edison;  
No. 484,582, Oct. 18, 1892, Edison;  
No. 528,273, Oct. 30, 1894, Lioret;  
20 No. 534,543, Feb. 19, 1895, Berliner;  
No. 548,623, Oct. 29, 1895, Berliner;  
No. 563,572, July 7, 1896, Day;  
No. 564,586, July 28, 1896, Berliner;  
No. 567,694, Sept. 15, 1896, Smith;  
No. 645,920, Mar. 20, 1900, Lambert;  
No. 649,385, May 8, 1900, Wolcott;  
No. 650,431, May 29, 1900, Stevens;  
No. 11,917, Re-issued July 2, 1901, Stevens;  
30 No. 657,527, Sept. 11, 1900, Edison;  
No. 667,202, Feb. 5, 1901, Edison;  
No. 667,600, Feb. 5, 1901, Stevens;  
No. 667,662, Feb. 5, 1901, Edison;  
No. 682,991, Sept. 17, 1901, Macdonald;  
No. 12,095, Re-issued Mar. 10, 1903, Macdonald;  
No. 682,992, Sept. 17, 1901, Macdonald;  
No. 12,096, Re-issued Mar. 10, 1903, Macdonald;  
No. 683,615, Oct. 1, 1901, Miller & Aylsworth;  
No. 683,676, Oct. 1, 1901, Miller & Aylsworth;  
40 No. 683,862, Oct. 1, 1901, Petit;

No. 683,979, Oct. 8, 1901, Petit;  
 No. 713,209, Nov. 11, 1902, Edison;  
 No. 726,965, May 5, 1903, Miller & Pierman;  
 No. 771,880, Oct. 11, 1904, Miller & Pierman;  
 No. 777,629, Dec. 13, 1904, Haug;  
 No. 785,319, Mar. 21, 1905, Miller & Pierman;  
 No. 790,516, May 23, 1905, Miller & Pierman;  
 No. 790,517, May 23, 1905, Miller & Pierman.

And the following British patents, namely: 10

No. 1,478 of 1894 to Young;  
 No. 15,206 of 1891 to Gouraud;  
 No. 12,593 of 1888 to Gouraud;  
 No. 1,644 of 1878 to Edison;  
 No. 9,762 of 1888 to Adams-Randall;  
 No. 1,058 of 1889 to Adams-Randall;  
 No. 9,996 of 1888 to Adams-Randall;  
 No. 15,232 of 1887 to Berliner;  
 No. 16,342 of 1887 to Anders.

And also the following French patent: 20

No. 230,177, to Lioret, May 18, 1893.

And any other Letters-Patent and printed publications of the United States and of foreign countries, to this defendant now unknown, but which when discovered it prays leave to insert herein by amendment as part of this answer.

9. Further answering, upon information and belief, defendant avers that during the pendency in the Patent Office of the application which eventuated into the patent in suit, claims were presented covering subject matter of which the said Joyce was not the original or first or sole producer or inventor; and covering more than was originally claimed by said Joyce, and covering what at the time said claims were first presented had already, for more than two years, been described in patents and other printed publications and been in public use within the United States, to-wit, described in each of the U. S. Letters-Patent herein- 40



before enumerated, and in public use by each of the patentees named therein, whose places of public use and whose last known addresses are those given in their respective patents.

10        10. And defendant further answering, on information and belief, avers that the said application which eventuated into the patent in suit was owned by the same parties in interest who owned the various patents to Edison, Miller, Pierman and Aylsworth, above set forth; and that by reason of the allowance and delivery to said interests of the patents last referred to (particularly Nos. 484,582, 414,761, 713,209, 667,662 above set forth) the subject matter of the claims of the patent in suit became no longer patentable (if they ever had been so).

20        11. The defendant is further informed and believes, and therefore avers, that the subject-matter of each and of all of the claims of the Joyce patent here sued on was, at the time the said Joyce filed his said application therefor, and at the time each of said claims was first presented, and now is, utterly wanting in patentable novelty in view of the state of the art set forth by each and by some and by all of the references hereinabove enumerated; and that therefore the said claims are invalid and of no effect in law.

30        Wherefore and for the causes aforesaid this defendant wholly denies the equity of complainant's bill herein, and all manner of wrongful and unlawful acts wherewith in the said bill of complaint this defendant is charged; denies that this defendant has done anything unlawful or anything in violation of any rights of this complainant in the premises; and further denies the right of the complainant to the relief, and each and every part thereof, asked for against it in said bill of com-  
40

plaint; and defendant submits it should not be compelled to make any other or further answer than that herein contained.

All of which matters and things this defendant is ready and willing to aver, maintain and prove as this Honorable Court may direct; and said defendant prays the same benefit from this Answer as if it had demurred to the bill where a demurrer would have been proper, or had filed a plea to the bill where a plea would have been proper; and it hereby humbly prays to be hence dismissed with its reasonable costs and charges in this behalf most wrongfully sustained. 10

AMERICAN GRAPHOPHONE COMPANY,  
By E. D. EASTON, President.

Attest:

E. O. ROCKWOOD, Secretary.

(Signed) C. A. L. MASSIE,  
Of Counsel for Defendant. 20

STATE OF NEW YORK,  
CITY AND COUNTY OF NEW YORK. } ss:

EDWARD D. EASTON, being duly sworn, deposes and says that he is President of the American Graphophone Company, the defendant named in the foregoing Answer; that he has read the said Answer subscribed by him as President of the defendant Company and knows the contents thereof; that the same are true of his own knowledge, except as to matters stated to be alleged on information and belief, and to those matters he believes it to be true. 30

EDWARD D. EASTON.

Subscribed and sworn to before me,  
this 4th day of March, 1907.

RALPH LANE SCOTT,  
Notary Public, No. 328, of New York County. 40



## UNITED STATES CIRCUIT COURT.

Southern District of West Virginia.

NEW JERSEY PATENT COM-  
PANY,*Complainant,**vs.*AMERICAN GRAPHOPHONE COM-  
PANY,*Defendant.*In Equity. On  
Letters Patent  
No. 831,668.

## REPLICATION.

The replication of the above-named complainant  
to the answer of the above-named respondent:

The repliant, saving and reserving unto itself  
now, and at all times hereafter, all and all manner  
of advantage of exception to the manifold insuf-  
ficiencies of said answer, for replication thereunto,  
says that it will aver and prove its said bill to be  
true, certain and sufficient in the law to be answer-  
ed unto, and that the said answer of the respond-  
ent is uncertain, untrue and insufficient to be re-  
plied unto by the repliant, without this, that any  
other matter or thing whatsoever, in the said  
answer contained, material and effectual in the law,  
to be replied unto, confessed and avoided, traversed  
or denied, is true; all which matters and things the  
repliant is now and will be ready to aver and prove  
as this Honorable Court shall direct and humbly  
prays as in and by its said bill it has already  
prayed.

Dated Charleston, West Virginia, March 23d, 1907.

PRICE, SMITH, SPILMAN &amp; CLAY,

Solicitors for Complainant.

## UNITED STATES CIRCUIT COURT.

Southern District of West Virginia.

NEW JERSEY PATENT COM-  
PANY,

vs.

AMERICAN GRAPHOPHONE COM-  
PANY.In Equity. On  
Letters Patent  
No. 831,668.

10

Testimony taken on behalf of complainant pursuant to notice before John F. Randolph, Esq., a Notary Public for the State of New Jersey, and Special Examiner by consent, at Orange, New Jersey, this 29th day of April, 1907.

Present:

FRANK L. DYER, Esq., and HERBERT H. DYKE, Esq., for complainant.

20

C. A. L. MASSIE, Esq., for defendant.

Defendant's counsel admits that the complainant company is a corporation of New Jersey, incorporated April 24th, 1903, and that it since that time has maintained its corporate existence.

It is hereby stipulated and agreed by counsel that printed copies of U. S. patents and blue-book copies of British patents, may be used by either side with the same force and effect as if regularly certified, subject, however, to correction in case of error.

30

MR. JOSEPH F. MCCOY, a witness produced on behalf of complainant, being duly sworn, testifies as follows:

By Mr. DYKE:

Q. 1. Please give your name, age, residence and occupation?

40



A. Joseph F. McCoy, 46 years, residence, Rahway, New Jersey, and am employed by the National Phonograph Company in general work.

Q. 2. Did you ever visit the factory of the American Graphophone Company, defendant herein, at Bridgeport, Conn.?

A. Yes, in October, 1904, and November 28th, 1906.

10 Q. 3. How do you fix the dates?

A. From a diary which I have and in which I make notes each day.

Q. 4. At the time of the first visit named, what part of the factory did you visit?

A. The molding part of the cylinder records.

Q. 5. Will you please state what you saw in the molding room at that time?

20 A. They had round tanks with melted wax, and there were four men at each tank, they took trays holding eight molds, and attached the trays to a hook over the tanks, and when a gong rang the molds were let down into the melted wax. They were left in the wax for several minutes, and the gong was rung again and they were all lifted up at the one time, and they were taken off the hook and put into cold water to cool; they were taken out of the water on to a table and reamed out, from there they were taken over to a table on the side, and from there they were put on to a mandrel and  
30 shaped up, and from the shaping they went to the next man who put the letters on.

Q. 6. When the molds were let down into the tanks of molten wax, did or did they not contain cores?

A. They did contain cores.

Q. 7. When, if at all, were these cores removed, before or after the reaming operation?

A. Before the reaming operation.

40 Q. 8. When the molds were introduced in the

molten wax, how did the wax flow into the space between the mold and the cores therein?

A. The wax flowed into the tops of the molds, as the molds were completely immersed in the wax.

Q. 9. What sort of walls had these molds?

A. As far as I recollect they were cylindrical molds with walls about  $\frac{1}{8}$  of an inch or possibly a little more, in thickness.

Q. 10. Did the wax come directly into contact with the exterior of the mold? 10

A. Yes.

Q. 11. Your understanding then, is that these molds having walls which, as you state, are about  $\frac{1}{8}$  of an inch in thickness, were completely immersed in a melted wax and allowed to remain therein several minutes before removal?

A. Yes.

Q. 12. What, if any, differences did you note in the way in which the molded records were made, in the defendant's Bridgeport factory on your latter visit of November 28th, 1906, from the way in which they were made when you visited there in October, 1904? 20

A. There seemed to be no difference whatever, as they seemed to be molding then about the same as the time of the first visit.

Q. 13. From the expression "about the same" do you mean to suggest that you noticed some slight differences? 30

A. No, none whatever.

Q. 14. I show you a blueprint from a drawing marked "Layout of Record Room"; do you recognize what is shown in this drawing?

A. Yes, it represents a plan view of the room in which duplicate records were made in the Bridgeport factory. A is a wax tank where the men were working, and B represents the mold placed on trays that were attached to a hook to let 40



the trays down in the melted wax; when they come up out of the wax, they were taken over to the water tank C, and taken from the water tank C to a table D; from the table D they were taken over to a long table E, on which are the edging machines H. This represents a plan of the apparatus that I saw at each time at the factory at Bridgeport.

10 Q. 15. I show you another drawing marked "Mold and Knife for Record Molding." Does this represent anything you saw in defendant's Bridgeport factory on the occasion of the two visits which you have mentioned, and if so, please explain what it is?

A. Yes, this drawing shows a plan and a side view of a tray carrying eight molds, which they were using at that time.

20 Q. 16. I direct your attention particularly to the sectional portion of the side view of the mold and tray at the lower left-hand corner of this drawing. Is that a correct representation of the mold as you saw it on each of these visits?

A. That looks correct from my view of it.

Q. 17. Is the relative thickness of the mold about as shown in this sectional view?

30 A. In regards to thickness, I could not say as to anywhere near the exact thickness, as I only saw the outside, but I should judge it to be the required thickness which would be about an eighth of an inch or more.

Q. 18. Where was the core in the molds which you saw?

A. In the center of the mold.

Q. 19. How was the core related to the central upstanding post M, which is shown in the drawing?

40 A. It fitted over the stem and the core came out of the mold easily when it was sufficiently cool for that purpose.

Q. 20. This must have been a hollow core, was it not?

A. I thought it was.

Q. 21. And a space was left outside the core and inside the mold for the reception of the melted wax flowing over the top of the molds, when immersed in the molten wax? Was that the case?

A. Yes.

Q. 22. When the tray containing the molds was dipped into the water, as you saw it, did the water come into contact with the outside of the mold, and inside of the core which you have stated to be hollow? 10

A. The tray with the mold, being dipped into the water the water came to about a half inch from the top of the mold. The water came in contact with the exterior of the mold, and it came within a half inch of the top, but I cannot say whether the water came into contract with the interior of the core. 20

Q. 23. What else than the record mold and tray is shown in this drawing?

A. There is a knife for trimming the interior of the molds.

Q. 24. How was that knife used?

A. The core was taken out of the mold and the knife was put in the mold and reamed out.

Q. 25. I show you a manuscript on two sheets of yellow paper and ask you what it is? 30

A. This is a report of my visit to the American Graphophone Company's factory at Bridgeport on November 28th, 1906. I wrote this report at the time of my visit and signed the same.

Counsel for complainant offers in evidence the two sheets of yellow paper, which has been identified by the witness, and the same is marked "Complainant's Exhibit McCoy Report." 40



By Mr. Massie: Exhibit objected to as secondary and incompetent and as immaterial.

Cross-examination by Mr. MASSIE:

10 Defendant's counsel enters timely objection to the testimony regarding Mr. McCoy's visit in October, 1904, (Qs. 4-11 inclusive) as immaterial, because it relates to matters before the issue of the patent in suit. The cross-examination proceeds *de bene esse* without waiving this objection.

x-Q. 26. How long have you been in the employ of the National Phonograph Company?

A. Since September 1902.

x-Q. 27. Were you in the employ of the National Phonograph Company on the occasion of your two visits to the factory of the Graphophone Company at Bridgeport?

20 A. Yes.

x-Q. 28. Do you know whether or not the persons in charge at that factory knew that you were connected with the National Phonograph Company?

A. No, I don't know whether they knew or not.

x-Q. 29. How did you come to visit the Graphophone factory the first time, in October, 1904?

30 A. I was in Bridgeport for several days at that time, looking up other matters in connection with price-cutting amongst several dealers who were handling Edison records, and I went out to the Graphophone factory a couple of days while I was in Bridgeport. And the second visit that I made to Bridgeport was in connection with the second-hand store who was advertising Edison records at 20 cents. I went down to see the man about selling the records at that price and had to stay over in town all night; the next morning I was up to see Mr. Bassett (L. H.) and I was telling him that I

40

had a few hours in town that day; and he told me he was going out to the American Graphophone Company's plant and if I had the time I could go out with him, as he wanted to see the Superintendent in regard to some business, and I told him that I would like to go through the factory. We went out to the factory and he saw Mr. Ray and he told Mr. Ray that he would like to take a visit through the factory and that his friend was also interested. The superintendent said that if we would wait for about ten minutes he would furnish us with a guide to show us through the different departments.

10

x-Q. 30. In your last answer, the part beginning "And the second visit, etc.," relates to your visit in November of last year, does it not?

A. Yes, sir.

x-Q. 31. On the occasion of your first visit to Bridgeport, in October, 1904, did you visit the Record Molding Department of the American Graphophone Company on both days?

20

A. The first visit to the factory I did not go inside, but stood at the window and looked in to see the molding, as there was a good view from where I was standing and stayed there about a half an hour.

x-Q. 32. On the next day, how long were you in the molding room?

A. I was not in at all, I was outside and looking in the window.

30

x-Q. 33. I understand then that in 1904 you were not actually in the molding room, and were never in the molding room of the American Graphophone factory until 1906?

A. That is right.

x-Q. 34. On the two occasions in October, 1904, when you were looking in the room, were you standing in the street that is parallel to the railroad track, but on the far side of the building from the railroad track?

40



A. Yes.

x-Q. 35. On the occasion of your second visit in November, 1906, you spent the night in Bridgeport you say, at what place did you stop?

A. The Atlantic House.

x-Q. 36. Who is Mr. Bassett?

A. Phonograph and bicycle dealer in Bridgeport.

10 x-Q. 37. Was this Mr. L. H. Bassett, and was he the proprietor of the second-hand store that was advertising Edison records at 20 cents?

A. He was Mr. L. H. Bassett, but he was not the proprietor of the second-hand store that was advertising Edison records at 20 cents.

x-Q. 38. What was the name and address of the party who was advertising Edison records at 20 cents?

A. I don't remember his name.

20 x-Q. 39. Do you remember where his store was?

A. Yes, about where it was.

x-Q. 40. About where was it?

A. Nearly a block west of Main street on the west hand side going up Main street, and on the south side of the street.

x-Q. 41. Did Mr. Bassett introduce you to Mr. Ray and did he so far as you know tell Mr. Ray that you were connected with the National Phonograph Company?

30 A. No.

x-Q. 42. How long did you remain at the Graphophone factory in November, 1906?

A. About an hour and thirty-five minutes.

x-Q. 43. About what hour was it that you went out to the factory on that occasion?

A. We arrived at the factory about twenty minutes after ten.

x-Q. 44. What train did you take to New York?

40 A. Between five and six the same afternoon.

x-Q. 45. Did the guide supplied by Mr. Ray show you and Mr. Bassett through the various departments of the Graphophone factory?

A. Yes.

x-Q. 46. Was the molding room that you visited the same room that you had seen through the window in 1904?

A. I don't know, but it seemed to be about in the same part of the building. So far as I know, I believe it was.

10

x-Q. 47. On the occasion of your visit last November at which entrance did you enter the factory, the one right beneath the office of the factory superintendent?

A. I entered on the Howard Avenue side, that is to say through the one story building where the executive offices were located.

x-Q. 48. Do you know what the temperature of the material in the kettles was on the occasion of either of your visits to Bridgeport?

20

A. No.

x-Q. 49. Do you know what was the temperature of the molds before they were put into the kettles?

A. No.

x-Q. 50. Do you know whether the molds with their cores and bases were oiled slightly before they were put into the kettles?

30

A. No.

x-Q. 51. When the trays containing the molds with their contents were taken out of the water, what was the very first thing done?

A. I don't know what the first thing was done after that.

x-Q. 52. What was the very first thing done that you saw after the trays were taken out of the water?

40



A. The core was taken out and the records reamed out.

x-Q. 53. Can you say how many minutes elapsed between the time the tray was taken out of the water and the time the cores were removed and the castings reamed out?

A. No.

10 x-Q. 54. What is your best recollection on the subject, about how long was it?

A. It may have been a number of minutes.

x-Q. 55. During your visit in that molding room how many different times were the trays immersed into the kettles, then put into the cold water and then put on the bench for reaming?

A. Three.

x-Q. 56. That is, three successive batches of records were molded while you were in the room?

20 A. I saw three racks of molds dipped in one kettle, which I was looking at.

x-Q. 57. About what was the temperature of the water in which the molds with their contents were dipped?

A. I don't know.

x-Q. 58. About how long did the molds remain in the water?

A. A number of minutes, I should judge.

30 x-Q. 59. Does that mean two or three minutes, or ten or fifteen minutes, or about what is the nearest estimate you could give?

A. Less than fifteen minutes.

x-Q. 60. And more than ten minutes, do you think?

A. No, I should think it was from three to six minutes.

40 x-Q. 61. In x-Q. 54 you said it may have been a number of minutes between the taking out of the molds from the water and the removal of the cores. What time do you there mean; about two or three

minutes, or ten or fifteen minutes, or what is the best general recollection you can give now?

A. I should judge about four minutes.

x-Q. 62. You have said in answer to Q. 5, that the molds were allowed to remain in the wax "for several minutes." About five minutes was that would you say?

A. They were in the wax about one and one-half or two minutes, or two and one-half it might not have been as long as that. 10

x-Q. 63. After one batch of molds had been dipped in the wax and removed, was another batch dipped almost immediately thereafter, or did the workmen wait until the first batch had been taken out of the water and had their cores removed and reamed out, before the next batch was dipped?

A. The next rack of molds were attached to the hook over the melted wax, and when the gong sounded a tray of molds was lowered in the wax. 20

x-Q. 64. Was the second set of molds immersed into the wax, while the first set was still in the water?

A. Yes, I think they were.

x-Q. 65. You have spoken of a hollow core in the mold L of the blueprint shown you by complainant's counsel, and have said that it surrounded the axial stem M of the mold. Was this core open at the bottom?

A. I don't know about the core, whether it was open or not. 30

x-Q. 66. Was this core open at the top?

A. I think there was a small hole through the core through which the spindle M protruded.

x-Q. 67. How was this core held in place in the mold?

A. I don't know; that is I don't know whether it was screwed down on the spindle, or simply allowed to rest over the spindle by gravity. 40



Q. 68. Are you sure that the spindle remained secured to the mold, and did not come off with the core?

A. I don't know.

x-Q. 69. So far as you know, did the mold itself as distinguished from the tray have a flange or thicker portion around its bottom?

A. I think it did.

10 x-Q. 70. Could you see this thicker portion of the mold?

A. Yes.

x-Q. 71. I call your attention to the thicker portion of the mold L shown in cross-section at the lower left-hand corner of the blueprint concerning which you have been examined "Mold and Knife for Record Moulding." Did you see that thickened portion at the factory of the Graphophone Company?

20 A. I couldn't say that I paid particular notice to that.

x-Q. 72. You have said that the wall of the mold which you saw at Bridgeport was about  $\frac{1}{8}$  of an inch thick. Referring to the same blueprint, in which the lower left hand corner shows a cross section that is manifestly much less than  $\frac{1}{8}$  of an inch thick, is it your understanding that this blueprint is drawn to scale to represent a much larger mold, so that the thickness of the wall is correctly indicated. Or, is the blue print inaccurate in showing the wall as too thin?

30 A. In regards to the blueprint I don't know what scale that was drawn to.

x-Q. 73. In the right hand end of this same blueprint appear two views that you say indicate a knife for trimming the interior of the molds. I call your attention to the upper view, the small one. Did you observe the part that appears to be a handle which extends into what seems to indicate the

40

hollow bore of this device? I mean did you observe the thing itself in the molding room at Bridgeport?

A. I did not go over to where they were reaming out the records, so I couldn't say anything about the knife, any more than to see it in operation at a distance.

x-Q. 74. Please look at the other blueprint concerning which you were examined, "Layout of Record Room." Do you understand this to be a correct plan drawn accurately to scale of the record room; or is it a mere diagram indicating in a general way the relative position of the various articles there shown? 10

A. I should call it a diagram showing the relative location of the wax kettle, water tank, table and edging machine in about the position that they were at the time that I was there. Of course, there was a large number of tanks down the length of the building, and also the water tanks to correspond with them. 20

x-Q. 75. Please indicate on that blueprint the direction or location of the street where you stood at the time you were in Bridgeport in 1904?

A. Holding sheet in the right position to read the printing thereon, I viewed the wax room from a point corresponding nearly to the right end of the upper side.

x-Q. 76. And what, if anything, was there in the floor space of the upper right hand corner when viewing this blueprint as just recited? 30

A. That is where the stairs led down into the molding room.

x-Q. 77. Were there any stairs there leading up to an upper floor?

A. Yes.

x-Q. 78. In 1904 could you see the edging machine from the window, or rather, did you see them?

A. No. 40



x-Q. 79. Did you observe whether or not there was any hole or opening in the bottom of the trays that carried the mold; I refer to either visit, and particularly the one of last November?

A. No.

10 x-Q. 80. You have said that the trays containing the molds were placed in the water which did not come to the top of the mold, but only to a point about  $\frac{1}{2}$  an inch from the top of the molds; so far as you know did any water come inside of the mold or inside of the core?

A. I didn't notice any water going over the mold on the inside, but when the rack was put in the tub the water splashed over sometimes, but I do not know whether any went in or not.

Re-direct by Mr. DYKE:

20 Rd-Q. 81. Mr. Massie asked you a number of questions as to the time occupied in performing certain operations at defendant's factory. Did you make any attempt to accurately determine these times when you witnessed the carrying out of defendant's process?

A. No, as I was just there to see how they made the record and did not take any time, or how long it took them to turn the records out.

Rd-Q. 82. Are you a mechanic, Mr. McCoy?

30 A. No.

Rd-Q. 83. Have you had any mechanical experience?

A. No.

Rd-Q. 83. Your observations then were based simply upon what you saw as a layman?

A. Yes.

40 Rd-Q. 84. And so far as you know, and so far as you were able to observe, the process carried out by defendant in November 1906, was the same as was carried out in October 1904?

Question objected to both as leading and as incompetent, in view of the re-direct examination, because of the witness's statement that he has had no experience in such matters, but was merely a layman, whereas the question called for a conclusion.

A. The operations looked to me to be the same.

Rd-Q. 85. Did you have a better opportunity in November 1906 to examine into defendant's operations than you did in 1904, or vice versa? 10

A. In November 1906 I was standing at the wax kettle and could see the operations more plainly.

Without waiving the objections already made, further cross-examination by defendant's counsel.

x-Q. 86. Did you see how the kettle was heated on either visit? 20

A. No.

x-Q. 87. On either visit did you see that the kettle was heated at all?

A. No.

x-Q. 88. You have said that you are not a mechanic, but you visited Bridgeport in connection with certain cases of price-cutting. Is that latter a general indication of your general duties for the National Phonograph Company?

A. Yes, that is some of the work that I do. 30

Signature and certificate waived.

Counsel for complainant offers in evidence copy of Letters Patent dated September 25th, 1906, numbered 831,668, granted to complainant, as assignee of Maurice Joyce, being the patent in suit, and the same is marked "Complainant's Exhibit, Patent in Suit." It is stipulated and agreed that the title to the patent in suit is in complainant and was at the date of the filing of the bill herein. 40



PETER WEBER, a witness called on behalf of complainant herein, having been first duly sworn, in answer to questions proposed to him, testifies as follows:

Direct examination by Mr. DYKE:

10 Q. 1. Please give your name, age, residence and occupation?

A. Peter Weber, aged 46 years, residence 46 Ridge street, Orange, N. J., and my occupation is superintendent of the Edison Phonograph Works, and other Edison companies.

Q. 2. Did you ever visit the factory of the American Graphophone Company, defendant herein, at Bridgeport, Conn.?

A. Yes, I did.

Q. 3. When?

20 A. Sometime in the latter part of March or the first part of April, 1905.

Q. 4. How did you happen to visit defendant's factory at that time?

A. I was invited by the Wile Gas Power Company at Rochester to look at the plant which they had installed at the Columbia Phonograph Company at Bridgeport.

30 Q. 5. Is the Columbia Phonograph Company the same as the American Graphophone Company, so far as you know?

A. Yes.

Q. 6. Did you go to Bridgeport with the representative of the Wile Company?

A. Yes, I did, I met him at the Grand Central Station.

Q. 6. Do you recollect whether anybody else went with you to Bridgeport?

40 A. The sales manager of the Nash Gas Engine Company, I think this company makes a gas engine.

Q. 7. Do you recall the name of this gentleman?

A. King.

Q. 8. Did you enter the factory of the American Graphophone Company?

A. Yes, sir.

Q. 9. Do you remember who took you in?

A. The Wile representative who fitted up the gas plant; he met us at the gate, of the factory entrance.

Q. 10. Did you go into the wax room?

A. Yes.

Q. 11. Was it there that the gas was being used?

A. A boiler had been installed there from the pipe line leading from the gas plant; that is the melting plant.

Q. 12. Did you go into the room where the molded records were made?

A. Yes, I passed through it.

Q. 13. Did you witness the method of making molded records by defendant?

A. I saw some of it.

Q. 14. What kind of these records were these, cylinder or disk?

A. Cylinder records.

Q. 15. Can you produce a drawing showing the apparatus which you saw in use in the molding room of the defendant company at the time of your visit and employed in connection with the manufacture of cylindrical sound records?

A. I had drawings made from the recollections I had which I herewith produce. The first of these drawings is a plan view showing, as I remember it, one unit in defendant's factory, and the second drawing shows the tray with molds attached and a reaming knife as I saw it used.

The drawings referred to are offered in evidence and marked "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 1," and



"Complainant's Exhibit, Defendant's Apparatus, Drawing No. 2."

Exhibits objected to as immaterial because purporting to relate to matters before the granting of the patent in suit, and further objected to as incompetent, since they have not been sufficiently proved.

10 Q. 16. In view of the latter part of the objection which has just been made, please state whether or not the original of these blueprints was made from your direction and at your request?

Objected to as immaterial.

A. Yes, they were made from hand sketches which I made within a few days after my return from Bridgeport and these sketches embody the principal points of the apparatus.

20 The blueprints are now objected to as worse than secondary evidence.

Q. 17. What became of the original sketches from which the drawing that these blueprints are copies of, were made?

A. I don't know.

Q. 18. Have you these original sketches in your possession now?

30 A. No, I turned them over to the draftsman and I don't know whether they were kept or not. They are perhaps of no value because after we had the tools and apparatus properly drawn out on paper.

Q. 19. The rough sketches then did not show the entire apparatus as illustrated by these blueprints, but were supplanted by oral instructions from you, as I understand it?

A. Yes, and they would not have been intelligible to any one except myself without oral explanation.

40 Q. 20. When was the original drawings made from which these blueprints are copies?

A. I can't remember exactly, but one of these drawings is dated September 27th, 1905, and I have no doubt that this is correct.

Q. 21. Can you produce any other drawing, illustrating defendant's apparatus at the time you saw it?

A. I produce another drawing, showing a single mold substantially as used by defendant and dated May 23, 1905, which is the date on which the drawing was made; that is when it was completed.

Q. 22. Was this drawing made under your direction?

A. I think it was, although may have given the instructions to my assistant, Mr. Aiken, who may have undertaken the actual supervision of the drawing.

The blueprint last referred to is offered in evidence and marked "Complainant's Exhibit of Defendant's Apparatus, Drawing No. 3."

The Exhibit is objected to on the same grounds noted against the other two blueprints.

It is stipulated and agreed between counsel that the three blueprint exhibits above introduced may be used with the same force and effect as the originals thereof, subject to defendant's objection as to their competency and materiality.

It is also stipulated and agreed that "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 1," and "Complainant's Exhibit, Defendant's Apparatus, Drawing No. 2," are two blueprint drawings to which the witness McCoy herein has testified.

Q. 23. Please take up the first two exhibits, Drawings No. 1 and No. 2, which you have produced and describe in detail defendant's apparatus as examined by you at the time of your visit and the process used by defendant in making molded sound records?



The examination based on these blueprints is understood to be objected to on the grounds already noted, and this objection is repeated without being expressly stated.

10 A. Referring first to Drawing No. 1, A represents the wax kettle filled with molten wax, and the B, B, B, B represent a tray with a number of molds on each tray. As far as I remember there were eight molds on each tray. These molds I assumed were immersed beneath the surface of the molten wax, because later on I examined the molds by feeling on the bottom of them and could find no opening through which the wax could enter, and assumed therefore that the wax must go over the top of the mold.

20 C C represent tanks filled with water, the trays with the molds were taken from the wax kettle; they were immersed in the water for the purpose of chilling or cooling the mold; from the water the trays were placed on table D, and the nickel core was taken out, and the reaming knife inserted or placed over the stud M; the knife was turned by means of a handle while the record was still in the mold and reamed out.

30 E is a table for edging machines which has an under shelf F, on which the tray of molds were placed after the reaming. A perforated pipe G was used for blowing cold air on the molds to cool them off which caused the records to shrink away from the molds and be taken out. The records were then placed on edging machines H to be trimmed off at the ends and cut to the proper length. I represents a tray with eight molds in front of the air pipe.

40 Referring now to drawing No. 2, J represents a tray on which molds L are mounted and M represents the center stud, which forms the guide for the reaming knife N. P is the knife proper and Q is

the small handle by means of which the knife is laid over against the mold while the knife is being inserted and by means of which the knife is turned out against the wax for reaming. O is the handle by which the knife is turned on the stud. K is the handle by which the tray is lifted. The operation of making duplicate sound records in defendant's factory at the time of my visit was as follows:

After the molds were prepared on trays, the trays were put into the wax kettle which was filled with molten wax and remained in there for a certain period, at least which I understood was five minutes; they were then taken out by means of a hoist over the tank and dipped into the water tanks; this water did not come above the top of the molds but chilled the outside of the mold; the trays were then put on the table D and the records were reamed out by means of the tool N, which was inserted over the stud M. After the knife proper was placed over the stud the reaming knife proper P was turned against the surface of the chilled wax and by means of the handle O the whole knife was turned around the stud M so as to smooth and size up the whole of the record. Then the trays were placed on the shelf F of table E in front of air pipe G to be colled off. After they had cooled sufficiently to cause the proper shrinkage of the record proper they were taken out and put on the mandrel of the edging machine and were trimmed off and that finished the operation as far as I saw it.

Q. 24. Did you ever make an apparatus such as you saw in defendant's factory?

A. Yes.

Q. 25. What became of this apparatus?

A. I believe it was turned over to you.

Counsel for complainant states that the apparatus referred to by the witness was intro-



10      duced as two exhibits in the suit pending before this Honorable Court on patent to Miller & Aylsworth, No. 683,615, entitled National Phonograph Company vs. American Graphophone Company, said exhibits being marked "Complainant's Exhibit, Weber's Reproduction of Defendant's Mold," and "Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool"; and that said exhibits are now on file in the office of the Clerk. Complainant's counsel notifies defendant's counsel that at the hearing he intends to make use of said model exhibits, if such course is considered desirable.

20      Defendant's counsel understands that if it seems desirable to defendant to inspect the exhibits aforesaid, or to have them produced for purpose of examination by defendant's witness, complainant's counsel will unite with us in having the same withdrawn from the Clerk's office at reasonable times and under reasonable precautions.

· Complainant's counsel consents to this understanding.

Q. 26. In the model apparatus which you made and which is above referred to, a core was shown as being seated on the stud or spindle M with the larger end of the core uppermost; did you see such a core in defendant's apparatus?

30      Question objected to as improper in form and as leading.

A. I don't believe I saw the core at all, I don't remember the core.

Q. 27. Have you any doubt that with defendant's apparatus as you saw it operated, a core was used?

Objected to as leading and without basis in the witness's testimony.

40      A. I have no doubt.

Answer objected to as incompetent on the ground that the witness has testified that he did not see the core.

The entire testimony of this witness is objected to as immaterial, on the ground that it relates to matters of date earlier than the granting of the patent in suit.

Cross-examination by Mr. MASSIE:

The cross-examination is *de bene esse* and without waiving this objection. 10

x-Q. 28. When you visited the Graphophone factory in the spring of 1905, was anything said or done so far as you know to let the managers or employees of that factory know that you were connected with the Edison Phonograph Works or other Edison companies?

A. I refused to go in at first because I did not want to go under false pretenses, and the representative of the Wile Power Company said that he had permission from the management to take anybody in whom he desired to show the experimental gas making plant, and that it was not necessary to be introduced to any one. 20

x-Q. 29. Has the Wile Power Gas Company installed a plant at the Edison laboratory?

A. Yes.

x-Q. 30. Did you speak at all with any of the workmen at the Graphophone factory? 30

A. None at all.

x-Q. 31. For your answer to Q. 23, I understand that you did not get a good look at the kettle containing the mold, but merely glanced at it, is that correct?

A. No, I did not get a good chance to look into it, when the molds were actually immersed.

x-Q. 32. Did you see the molds being immersed, in the act of being put into the kettles?

A. No, I don't believe I did. 40



x-Q. 33. You did not observe, did you, whether the molds were lowered gradually and with comparative slowness or whether they were dropped quickly so as to splash?

A. No. I did not observe that.

x-Q. 34. Did you observe whether or not the molds and their cores and bases were slightly oiled before they were immersed into the molten wax?

10 A. No, I did not.

x-Q. 35. What can you say as to the temperature of the molds before they were immersed into the molten wax?

A. I remember distinctly asking the representative of the Wile Company as to what temperature the wax was heated and he said that it was anywhere from 400 to 500° F. I mentioned the fact to him that the temperature of our wax was not as high as that. As to the temperature of the mold, core and tray, I don't know anything about it.

20 x-Q. 36. Did you see any one heating these molds before they were put into the kettles containing the molten wax; or did you see any of the molds being heated before they were put in the kettles?

A. No, I did not.

x-Q. 37. The lower left hand corner of Complainant's Exhibit Defendant's Apparatus Drawing No. 2, shows a sectional view of one mold and of the adjacent portion of the tray. Did you see anything corresponding to this in the Bridgeport factory; or is this merely a detail designed by you as one way of securing the mold and the stud M upon the tray?

30 A. All I saw was the tray carrying the mold; as to this detail I am not able to say exactly how it was used.

x-Q. 38. Does any one of the three blueprints which you have identified show the core?

40 A. No.

x-Q. 39. Are you sure that the stud marked M in your blueprint was not removed from the mold L along with the core?

A. No, it stayed right there; it was not removed.

x-Q. 40. In the second paragraph of your answer to Q. 23, the transcript makes you say that after the trays were placed on tables D "the nickel core was taken out"; did you see this done at defendant's factory?

A. No, I did not notice that.

x-Q. 41. Were the molds when taken from the wax kettle entirely submerged below the water in tanks C?

A. No, they were not entirely submerged under the water.

x-Q. 42. So far as you know the water was not in any way applied to the interior of the mold or any core that might be in the mold, was it?

A. No, it was not.

x-Q. 43. I understand that Complainant's Exhibit, Defendant's Apparatus, Drawings No. 1 and No. 2, were completed about September 27th, 1905, the date appearing on one of them. Is that correct?

A. Yes.

x-Q. 44. And they were commenced a few days or possibly a week before that date?

A. Yes.

x-Q. 45. And that those drawings were made by the draftsman from certain sketches given him by you, aided by oral instructions, and that you, or possibly your assistant, Mr. Aiken, supervised these drawings. Is that correct?

A. Yes.

x-Q. 46. And that the sketches referred to were rough sketches that did not show the entire apparatus and would have been unintelligible to any

10

20

30

40



one else without oral explanation and dealt principally with the reaming tool?

A. Yes.

x-Q. 47. How long did you remain in the defendant's record room?

A. Probably three or four minutes; I am positive it was less than five, because I only heard the gong ring once.

10 x-Q. 48. Did you go over to the edging machines and examine them?

A. Yes, I did.

x-Q. 49. Did you go to the reaming table D and watch the operations?

A. That is where I stood at first and watched the operations.

20 x-Q. 50. So far as you know did the defendant begin to cool its molds and their contents as soon as they were taken out of the kettle of molten wax; or were they allowed to stand and set first before the cooling operation began?

A. It is my recollection that they took it from the wax kettle and put it directly into the water tanks and left it there for a moment and then took it out and placed it on the table D.

30 x-Q. 51. Assuming that the molten wax was 400 degrees F. or over, the effect of putting the molds into the water tanks would be to chill the contents of the molds, would it not?

A. Yes.

x-Q. 52. You say the molds were left in the water tanks "for a moment." Can you be a little more definite as to what you mean?

A. I might say a few seconds, to the best of my recollection.

40 x-Q. 53. So far as your observation and recollection go, was it long enough for the wax in the mold to assume a solid condition, or become set?

A. Yes, long enough to become set. It was probably more or less plastic, because it had to be reamed, and you could not ream it if it became absolutely hard.

x-Q. 54. That is, when it was taken out of the water it was already sufficiently set to be reamed, and it was reamed right away?

A. Yes, as soon as it could be moved over to the table D the record was reamed out.

10

Signature and certificate waived.

Defendant's counsel admits that the following is a correct copy of a stipulation made between counsel for complainant and counsel for defendant in the suit pending in this Honorable Court on Miller & Aylsworth patent No. 683,615, between the National Phonograph Company, complainant, and the American Graphophone Company, defendant, and that the bill of complaint in said suit was filed on June 30th, 1905, the latter admission being subject to correction in case of error.

20

"It is hereby admitted by counsel for defendant that subsequent to the first day of October, 1901, and prior to the filing of the bill of complaint herein, the defendant, at its factory in Bridgeport, Connecticut, made use of devices or apparatus for duplicating phonograph records, substantially like those described in the deposition of Peter Weber, taken on behalf of complainant herein and shown in 'Complainant's Exhibit, Defendant's Apparatus, Drawing No. 1,' 'Complainant's Exhibit, Defendant's Apparatus, Drawing No. 2,' 'Complainant's Exhibit, Weber's Reproduction of Defendant's Mold,' and 'Complainant's Exhibit, Weber's Reproduction of Defendant's Reaming Tool.'"

30

That in operating with such devices or apparatus within the time stated, the defendant proceeded as follows:

40



The material used by defendant in the manufacture of its duplicate records was a wax-like material or composition. This composition was maintained in the wax kettle at a temperature of about 350 degrees F. A tray containing eight molds, each carrying the negative representation of a sound record on its bore, was now immersed below the surface of the molten composition, so that the composition flowed into the molds over the tops thereof, filling the space between each mold and its core. This immersion was continued for about five minutes. The tray was then removed from the wax kettle, carrying the molds filled with the composition in a molten state, and the molds were then immersed in cold water, so as to chill the material to a temperature of about 150 degrees F. At this temperature the material, while still tightly engaging the mold, was relatively soft and plastic. The core was then removed from each mold, leaving a layer of congealed material adhering to the bore and the reaming tool was then introduced so as to remove the surplus material and to form a plurality of concentric ribs on the interior of the duplicate record, said ribs being of gradually increasing depth. The molds were then subjected to a blast of cold air, so as to further reduce the temperature of the duplicate records. In consequence of the cooling of the records, a diametric contraction thereof takes place so as to permit their withdrawal from the mold. The molds were in some cases provided with detachable bottom plates screwed thereto, said plates bearing raised characters constituting a descriptive title of the record, so that an impression of the characters on said plate was made in the end of the record during the process of molding the latter. After the records had been removed from the molds, the material was cut off at the unfinished end, so as to result in the pro-

duction of a record of the desired length, and the records were then finished for the market."

Defendant's counsel admits it to be a fact that the aforesaid stipulation was made in the case aforesaid, but objects to the same being read into this case, for the reason that the stipulation was made in another suit, where the issues were not the issues here presented; that the said stipulation was made on December 22, 1905, prior to the granting of the patent here in suit, and therefore, it is immaterial. 10

Complainant's counsel replies that the stipulation above entered on the record relates to certain apparatus and process which were admitted by defendant as having been used by it and which conformed precisely with the description of defendant's process as given by the witness Weber. It appears from the testimony of the witness McCoy that in November, 1906, defendant was still using this process. Complainant's counsel believes he has made out a sufficiently comprehensive *prima facie* case as to warrant his examination of defendant's workmen as to the process carried out by defendant subsequent to the grant of the patent in suit and prior to the filing of the bill herein. 20

Defendant's counsel replies that the description given by complainant's witness, Weber, is admitted by Mr. Weber to be in part deductive (if not, in our opinion conjectural) and that the testimony of the witness, McCoy, is incompetent, because he is not qualified and has given his conclusions. Defendant's counsel likewise points out that a stipulation upon one patent may not be strictly accurate with regard to details, which details may be the very essence of a suit upon another patent. Therefore, he renews the objection to the reading into this case of a stipulation given in the former suit. 30

Complainant's counsel asks if defendant's counsel will consent to a disclosure of defendant's process through Mr. Macdonald, defend- 40



ant's factory manager, or other competent workman, as that process may have been carried out at Bridgeport subsequent to the granting of the patent in suit, and prior to the filing of the bill herein?

10 Defendant's counsel replies that he has already orally agreed to produce defendant's factory manager, Mr. Macdonald, at a convenient date in Bridgeport, to be examined by complainant's counsel. As to whether defendant will consent to disclosing the process referred to, that matter can best be determined at the time of cross-examination. Counsel here present does not feel authorized to consent to this broadly, but will certainly not make any improper objections.

Adjournment subject to agreement.

# UNITED STATES CIRCUIT COURT.

20

Southern District of West Virginia.

NEW JERSEY PATENT COMPANY,	}	In Equity. On Letters Patent No. 831,668.
<i>vs.</i>		
AMERICAN GRAPHOPHONE COMPANY.		

BRIDGEPORT, CONN., May 13th, 1907.

30 Complainant's *prima facie* proofs taken for final hearing before W. R. Miller, Esq., Notary Public and Special Examiner by consent.

Met pursuant to agreement.

Present:

Counsel as before.

40 THOMAS H. MACDONALD, a witness called on behalf of the complainant, having been first duly sworn, testifies as follows:

By Mr. DYER:

Q. 1. You are, I believe, the factory manager of the American Graphophone Company, defendant herein?

A. I am.

Q. 2. And you are familiar with the process employed by defendant for making duplicate cylindrical talking machine records?

A. I am.

Q. 3. Have you read a certain stipulation which appears on the record herein following answer to cross-question 54 of the deposition of Peter Weber, a witness for the complainant?

A. I have.

Q. 4. Kindly state whether this stipulation correctly describes the process followed by defendant for making duplicate cylindrical talking machine records at its factory at Bridgeport, Conn., at any time between September 25th, 1906, and December 1, 1906?

A. It does substantially describe the process.

Q. 5. Did defendant follow the same process for making these records between September 25th, 1906, and December 1st, 1906, that it had used for some years, prior to the former date; or in other words, beginning with about August, 1903, has it not continuously used the process disclosed in this stipulation?

A. The process described has been used continuously since its adoption. I am not certain at this time just when it was adopted.

Q. 6. Since the defendant company has been making duplicate records it has used two processes; has it not; one like that disclosed in the stipulation and the other in which the material was cast in a substantially cold mold, then heated by superheated steam, and finally chilled. I, of course, refer to molded records?



A. That is correct.

Q. 7. The second process, last above referred to, has not been used I understand for several years?

A. It has not been used.

10 Q. 8. And between September 25th, 1906, and December 1, 1906, the process used by defendant was one in which the molds were submerged for several minutes in the hot molding material so as to permit the material to become entirely quiescent and thereby take a sharp impression?

Objected to because the last part of the question calls for a conclusion.

A. We used a process of submerging the mold in the hot wax during that time.

Cross-examination by Mr. MASSIE:

20 x-Q. 9. The stipulation copied after the Weber testimony specifies various temperatures, the exact number of minutes the molds are emerged into the molten wax, etc. Are these exact details familiar to your mind; or in assenting to this stipulation were you merely speaking generally?

A. My answer was given in a general sense. I have not studied the stipulation carefully and cannot be sure that the details are all correctly given.

30 x-Q. 10. Still speaking generally, and speaking off-hand without consulting any records, about how long ago did you begin making molded cylinder records in accordance with the general process set out in that stipulation?

A. Three or four years ago.

x-Q. 11. And still speaking generally, how long ago did you first begin the casting of molten cylinder material in a heated mold?

A. About six years ago, possibly seven.

40 x-Q. 12. Mr. Dyer has named two processes as employed by the defendant (Q. 6). You may name

briefly any other process formerly employed by defendant in molding cylinder records?

A. The molds were placed in an oven heated by gas and brought to a temperature considerably above that of the melted wax. The tray was then drawn out of the oven, the molds were filled with the wax from a pouring pot, the molds were then again placed in an oven, for a very short time, when they were taken out and placed in cold water. From this point the process was similar to that which we are now using with the exception that we use the same core which was used with the steam molds, that is, where the thread is cast in the wax and not cut with a reamer.

x-Q. 13. I understand that in the method formerly employed by you the mold was heated before the wax was poured in; whereas, in the method employed by defendant continuously since before last September, the wax is introduced into a comparatively cold mold which is then heated by being submerged in the molten wax. Is that correct?

A. That is correct.

Re-direct examination by Mr. DYER:

Rd.-Q. 14. From your study of the stipulation referred to, do you observe any mis-statement therein as to the process followed by the defendant continuously since prior to September, 1906?

A. I do not.

Signature and certificate waived.

Adjourned subject to notice.

ORANGE, N. J., June 13, 1907.

Met pursuant to agreement.

Present:

Counsel as before.

DELOS HOLDEN, a witness produced on behalf



of complainant, being first duly sworn, testifies as follows:

Direct examination by Mr. DYER:

Q. 1. Will you please state your name, age, residence and occupation?

A. Delos Holden, age 35, residence, Upper Montclair, N. J. Occupation, Solicitor of Patents and Patent Expert.

10 Q. 2. What training and experience have you had which would qualify you to testify as an expert in this cause?

A. I pursued a 4-years' course in Science at the University of Colorado and graduated in 1893. I subsequently entered the Columbia University, New York, and took a post-graduate course in Electrical Engineering, graduating in 1896. For several years thereafter I was employed as a testing electrician by the Edison Electric Illuminating Company, New York, now the New York Edison Company. The  
20 business of this company consisted in supplying electric light and power to consumers throughout the city of New York and during the time I was with the company I made a great number of tests upon their lines, putting in temporary wire and instruments for conducting and measuring currents of very heavy amperage. In 1898 I was appointed Assistant Examiner in the United States Patent Office and spent several years in the examination of patent applications with the view of determining the meaning of the claims contained therein and their novelty and patentability in view of prior patents and publications. In 1901 I resigned from the Patent Office and entered my present profession. During this time I have prepared and prosecuted a large number of applications for patents in the various arts. I have also prepared expert opinions upon the validity and scope of patents and have  
30 testified as an expert in regard to the novelty of in-  
40

ventions and the question of infringement thereof. Since the latter part of the year 1903, a large part of my time has been devoted to the phonographic art, including the instruments or machines and mechanisms, and the phonograms or sound records, and the methods of producing the said phonograms, and I was for a number of years connected with the Patent Department of Thomas A. Edison and the National Phonograph Company. I have witnessed many times the manufacture of phonographic sound records as carried on commercially on a very large scale by the said Phonograph Company, and I have also taken part in experiments connected with the molding of phonograph records from various compositions.

Q. 3. Have you read United States Letters Patent No. 831,668, granted September 25, 1906, to New Jersey Patent Company as assignee of Maurice Joyce for a "Method of Duplicating Phonograms," and do you understand the invention therein set forth and claimed in Claims 3, 4 and 6 thereof; and if so, please explain your understanding of the said invention and of the meaning of the said claims?

A. I have read the patent referred to and understand the invention described therein and covered by Claims 3, 4 and 6 thereof. The invention relates to a method or process for duplicating or multiplying phonogram cylinders or records by means of a tubular mold which bears upon its interior surface a reverse impression of a sound record so that a phonogram may be made by introducing within the mold melted wax-like material and then allowing or causing the same to set and harden, and thereafter removing the hardened casting from the mold whereby the same mold may be used over and over again and a large number of phonograms produced therefrom. The object of



the invention in the language of the specification, "is to reproduce fac similes of phonogram-cylinders in as large numbers as may be desirable" (page 1, lines 12 to 14).

10 The object of the inventor is carried out by first producing a phonogram in the form of a hollow wax cylinder having the sound waves impressed, indented or cut in the usual manner by the action of a cutting stylus operated by a recording diaphragm, such a phonogram being technically known in this art as a "master record," and this record is shown in Figs. 1 and 2 of the drawing as the hollow cylinder A. The patentee describes first how the mold is made from this master record and the procedure described is one of electro-deposition which is carried out by clamping the cylinder A between a metallic base B having a curved surface as indicated at B' and a similar  
20 plate or cap C having a curved surface C'. The threaded rod or bolt D and nuts D' serve to clamp the parts firmly together. The surfaces of the wax cylinder A, and the plates B and C are then covered with finely powdered graphite or blacklead and then placed in a suitable electro-deposition bath, being connected in a well known manner with a source of current so that a deposit of metal H such as copper will be formed upon the parts A, B and C. When a sufficient thickness of metal has  
30 been obtained, the device is taken out of the deposition bath, and the bolt D and plates B and C removed from the cylinder A and deposited shell H. The wax cylinder A is then taken out from the electro-deposited shell in any manner, as by melting. This leaves the seamless, tubular shell shown in Figure 4 of the drawing, which consists of a cylinder having on its inner surface an exact copy in reverse of the sound record which was carried by the original or "master record" A, and with  
40

flaring ends, the object of which is to form a mouth into which melted wax can be poured. The idea of making both ends flared is to allow one to select that which is most desirable and the other one is then cut off and the cylinder fitted into a base or holder I (see Fig. 5), thus forming a mold. A hollow core K is threaded within the central opening of the base I whereby the core is centered with respect to the mold. The mold, core and base are then slightly oiled and are then heated to near the temperature of the melted wax which is to be used in the molding operation. The melted wax is then poured into the hot mold and fills the space between the mold H and core K, being designated in Fig. 5 by reference letter L.

The patentee sometimes, but not necessarily, applies pressure to the wax column, for the purpose of pressing the wax against the inner surface of the mold, and states that this may be done by screwing the core K down into its base I the core being made tapering in form. This operation is performed after the wax has set and is in plastic condition, but before it has hardened.

The mold and contents are then cooled as by immersing the same in a bath of cold water, or by passing cold water through the hollow core K or other cooling means may be employed. (Page 2, lines 14 to 18).

The patentee continues in the following language:

"The cooling of the wax, which is of usual phonogram compound, causes it to shrink away from mold H, and the wax duplicate phonogram can now be removed from the end of the mold, the shrinkage being great enough to permit this removal without injury to the phonogram record by direct longitudinal movement of the phonogram. By a repetition of the



molding process multiplied copies can be obtained to any extent.

"The core is preferably withdrawn from the mold with the phonogram adhering thereto. Then the core may be removed and the ends of the phonogram dressed up, so that the new phonogram is an exact reproduction of the original, or the core may be permanently left in the phonogram."

10 The material used by the patentee he describes as "wax" and also as "plastic material" and also states, lines 49 to 54, page 2, that

"My duplicates may be made of any fusible substance used for phonograms, provided the shrinking of the material or the expansion of the metallic shell permits the withdrawal of the duplicate from the mold."

Claim 3 of the patent under consideration reads as follows:

20 "3. The process of duplicating sound-records in wax-like material which consists in casting within a hot, seamless, tubular record-mold, fused wax-like material at substantially the same temperature as the mold, cooling the mold and contents so as to cause the material to shrink away from the surface of the mold, and removing the hardened casting longitudinally from the mold, substantially as set forth."

30 It will be observed that as a first step in the process the wax-like material is cast within a hot, seamless, tubular record mold. The object of using a "tubular" mold is to obtain a phonogram which will be in the form of a cylinder, a desirable form which is and I understand, always has been used to a great extent in practice. One of the difficulties, however, in the use of a tubular mold is the removal of the casting from the mold since the sound record is in the form of minute elevations  
40 and depressions upon the surface of the casting

which interlock with the surface of the mold.

If a sectional mold were used, as is common in ordinary casting operations, it could be taken apart to release the record, but the patentee uses a "seamless" mold and therefore uses a material for making a record whose co-efficient of shrinkage is greater than that of the mold so that by cooling the mold and contents as specified in the claim, the material is caused to shrink away from the surface of the mold, and it becomes possible to remove the casting from the mold by a longitudinal movement.

The object of using a hot mold or a mold whose temperature is substantially the same as that of the fused wax-like material, is to enable one to obtain a perfect casting, and it should be noted in this particular that the molding or casting of a phonograph record is an entirely different proposition from the molding or casting of an ordinary article of commerce, as, for example, an iron casting which may be used for the body of a machine. In one case the casting must be a faithful duplication of microscopic elevations and depressions which constitute the sound record, because unless these minute waves are perfectly copied, the casting will not be suitable for use as a phonogram, whereas in ordinary casting operations such as the one I have mentioned, there is no such problem involved, the surface may be rough, and there are no microscopic parts to be duplicated. For this reason there is no analogy between the molding of phonographic records and the casting of ordinary articles of commerce. If one attempts to use a mold whose temperature is below the congealing point of the wax, as soon as the wax comes in contact with the surface of the mold it will at once congeal and in so congealing it would be likely that air would be imprisoned between the wax and the mold, thus forming flaws in the surface of the



10 casting which would render it unfit for use as a sound record. The use of a hot mold, that is, one above the melting point of the wax obviates this difficulty, and enables the wax before it sets to enter all of the minute depressions of the surface of the mold so as to fill them, and the air has an opportunity to escape before the wax sets, whereby a casting or phonogram record having a perfect surface will be obtained. There is an interval when the entire contents of the mold is liquid, which could not be the case when a cold mold, that is one whose temperature is below the congealing point of the wax, is used.

20 The second step of the process of claim 3 is the cooling of the mold and contents so as to cause the material to shrink away from the surface of the mold. This cooling is accomplished by immersing the filled mold in a bath of cold water, or by passing cold water through the hollow core K, or other cooling means may be employed. The cooling causes the wax in the mold to solidify and eventually to harden and contract or shrink so as to become smaller in diameter than the core of the mold, thus releasing the microscopic elevations and depressions of the sound record surface from interlocking engagement with the correspondent irregularities of the interior surface of the mold.

30 The third and final step of the process is the removing of the hardened casting longitudinally from the mold, which is made possible by the shrinkage just referred to, without injury to the record.

Claim 4 of the patent in suit reads as follows:

40 "4. The process of duplicating sound records in wax-like material which consists in casting within a hot, seamless, tubular record-mold, fused wax-like material at substantially

the same temperature as the mold, allowing the material to set, cooling the mold and contents so as to cause the material to shrink away from the record-surface of the mold, and removing the hardened casting longitudinally from the mold, substantially as set forth."

This claim is the same as claim 3, except that it specifies as a step of the process "allowing the material to set" after the fused wax-like material has been introduced within the record mold and before the mold and contents have been cooled sufficiently for the material to harden and shrink away from the mold. In the patent the material is allowed to set by leaving the mold filled with the melted material a sufficient length of time for it to lose sufficient heat to cause it to assume a plastic condition. While in this condition the material is in close engagement with the surface of the mold, and is soft, so that it can be readily worked. The patentee says that while the wax is plastic, he may apply pressure to the interior thereof, so as to press the wax against the surface of the mold.

In other words, the essential difference between claims 3 and 4 is that the fourth claim is necessarily limited to a process in which the cooling is effected in two steps, the first, to cause the material to set, and the second, to cause it to harden and shrink. The advantage of cooling by two steps instead of one is that by cooling in two steps it becomes possible to perform any operation that may be desired upon the wax while in plastic condition. The third claim, on the other hand, specifies a process in which the cooling operation may be performed *either* continuously in one step or successively in two or more steps. The fourth claim, however, does not specify the step of applying pressure to the material while in plastic condition, this feature being covered by Claim 5, and Claim



4, in my opinion, is drawn with a view to covering the idea of causing the material to assume a plastic condition so as to allow any operation to be performed upon the wax while it is within the mold and in a plastic condition and before it has cooled sufficiently to become hard.

Claim 6 reads as follows:

10

"The process of duplicating sound-records in wax-like material, which consists in casting within a hot, seamless, tubular record-mold, fused wax-like material at substantially the same temperature as the mold, placing the mold in a water-bath and removing the hardened casting longitudinally from the mold, substantially as set forth."

20

This claim is similar to claim 3, but is more specific, since it specifies that the mold is to be placed in a water bath, whereas claim 3 merely states that the mold and contents are to be cooled. The placing of the mold in a water bath effects a more rapid cooling than would the mere leaving of the mold and contents in the atmosphere, and is, therefore, desirable in commercial practice wherein economy is effected by the rapid carrying out of the process.

30

Q. 4. Have you read the testimony of Joseph F. McCoy, Peter Weber and Thomas H. Macdonald, taken on behalf of complainant in this cause, and the stipulation read by complainant's counsel to Macdonald, and do you understand the process practiced by the defendant herein, as described by said witnesses, McCoy, Weber and Macdonald and as described in the said stipulation. If so, please state whether or not, in your opinion, the said process embodies the invention of claims 3, 4 and 6 of U. S. Patent No. 831,668; and in so doing you may give the reasons upon which you base your opinion?

40

A. I have read the depositions and the stipulation referred to and I believe that I thoroughly understand the process described by the said witnesses, and the said stipulation. The testimony of the various witnesses is in accordance with each other and with the stipulation; that is, the process described by each witness is the same process as that described in other language by the other witnesses, and set forth in the stipulation. The process described is a process for duplicating or multiplying phonogram cylinders or records by means of a tubular mold which bears upon its interior surface a reverse impression of the sound record, so that a phonogram may be made by introducing into the mold fused wax-like material, allowing or causing the same to set, harden and shrink, and thereafter removing the hardened casting from the mold, whereby the same mold may be used over and over again, and a large number of phonograms produced therefrom. Facsimiles of phonograms may in this way be produced in as large numbers as may be desired.

Referring to claim 3 of the said patent, I find that defendant uses a process of duplicating sound-records in wax-like material, which consists in casting within a hot, seamless, tubular record-mold, fused wax-like material at substantially the same temperature as the mold. This wax-like material, as stated in the stipulation, is maintained in a kettle at a temperature of about 350 degrees Fahrenheit. A tray is used which carries a number of molds each of which is a seamless, tubular record-mold having upon its interior surface a reverse impression of the sound-record which it is desired to duplicate, and similar to the mold H of the said patent. These molds upon the tray are first immersed within the molten composition. The object of this step of the process is to fill the mold with wax and to heat the mold. The mold is left in the hot wax for about

10

20

30

40



five minutes. During this time the mold is brought to the same temperature as the wax-like material. In the process described in the specification of the patent, the mold is heated before the fused wax-like material is introduced, whereas in the process practiced by the defendant, the mold is immersed within the wax-like material and is heated thereby, and is not removed from the material until it has reached the same temperature as the material. In either case, the result accomplished is the same, that is, one obtains by this step of the process a hot, seamless, tubular record-mold filled with completely fused wax-like material, at substantially the same temperature as the mold. If one should take a mold whose temperature is below the congealing point of the wax-like material, and pour in the hot, melted wax, then the material contained therein would not be completely fused but would be partially solidified, because there would be a layer of congealed material in contact with the mold and if one should take a cold mold and immerse it in a kettle of fused wax-like material, that is, hot wax, the mold at first would cause a layer of wax to congeal upon it, but if he leaves the mold within the wax for a few minutes, the congealed wax will all melt, and the temperature of the mold will be brought up to that of the wax-like material, and the result produced will be precisely the same as if one had originally taken a hot mold at substantially the same temperature as the wax and filled it therewith either by pouring or immersing. It appears clearly immaterial whether the empty mold be *first heated* and then filled with the fused wax-like material, or whether it be first filled with the fused wax-like material, and then heated thereby, because, in either case, the desired result obtained is the same, viz., a hot mold filled with fused wax-like material at substantially the same temperature as the mold. The advantage of this

step is that it insures the escape of every particle of air which was contained in the mold prior to the introduction of the wax, by providing an opportunity for the air to escape through the melted wax instead of being imprisoned by the congealed wax which instantly forms on a cold mold, thereby producing holes in the surface of the casting.

The claim under consideration specifies as the next step of the process, "cooling the mold and contents so as to cause the material to shrink away from the surface of the mold." This step is comprised in the process of the defendant, in which the mold after being filled with wax and heated is removed from the wax kettle and placed in a water bath which abstracts enough heat to cause the wax to solidify and become plastic. The core is then removed and the bore of the record is reamed out. The mold and contents are then placed in a blast of air so that more heat is abstracted, the result being that the material within the mold hardens and contracts so as to shrink away from the surface of the mold. In the process used by defendant therefore the cooling operation called for by Claim 3 of the patent in suit is performed in two steps, viz., the placing of the filled mold in a water bath and later in an air blast. These steps are separated by the step of reaming the casting while plastic, but, nevertheless, the cooling of the casting is going on during this reaming operation. In the description of the patent, the cooling is effected after filling the hot mold with the fused wax-like material by immersing the mold and contents in a bath of cold water, which causes the wax to cool, harden and contract, so that it shrinks away from the surface of the mold. The patent does not describe the reaming out of the bore of the record, but this is merely an additional step practiced by the defendant which does not affect in any way the other steps of the process, and does not

10

20

30

40



in any way alter the sequence of operations by which the sound record is successfully produced, as called for by Claim 3.

The last step of the process of Claim 3 is the removal of the hardened casting longitudinally from the mold. This step is performed by the defendant as soon as the casting has shrunk or contracted sufficiently to allow it to be done.

10

I do not attribute any importance to the fact that whereas the patent in suit describes the use of a water bath for cooling the mold and contents so as to cause the casting to shrink away from the surface of the mold, the defendant effects the cooling operation in two steps, first by using a water bath for causing the material to solidify or set, and second, by using an air bath for causing the further cooling of the record and the shrinkage thereof which enables it to be removed longitudinally from the mold. An air bath or blast is the equivalent of a water bath, as it operates in substantially the same way to produce the same result.

20

30

It is immaterial, as I have before stated, that the cooling as practised by defendant is at first only partially effected so as to leave the wax for a short time in a plastic condition so that the reaming operation can be carried out as the reaming is merely an additional feature which is carried on during the cooling of the record and does not take the process away from the invention set forth in the claim. In my opinion, therefore, the process used by defendant is identical, with that described in the patent in suit and defined in Claim 3 thereof, the same steps being practiced in the same order and for the same purpose, and the same result being obtained in the same way.

40

Referring to Claim 4, this claim is exactly the same as that which I have just treated, except that

is specifies as an additional step prior to the cooling of the mold and contents, "allowing the material to set." As I have just stated, defendant allows the material to set by placing the same in a water bath, and after it has set, but before it is hardened, the mold is taken from the water bath, and the core removed therefrom and the bore of the record is reamed out by a reaming knife. This operation is performed during the cooling of the record and while the material is warm and plastic and before it has hardened and shrunk sufficiently to cause the material to leave the record surface of the mold. The wax being plastic, can be very easily reamed out, and there is no danger of injuring the record by reaming it at this stage of the process, whereas if one should wait until the record had become hard and cold, the operation would be much more difficult. In the process as described in the patent, the patentee recognizes that the wax passes through a period of plasticity, as he says that if one desires to apply pressure to the wax while it is in contact with the surface of the mold, one may "wait until the wax has partly set and then screw down the tapering core into its base I," which "not only compresses, but expands the wax outwardly, insuring that all parts of the mold are impressed into and reproduced by the wax." The claim under consideration does not say anything about applying pressure to the congealed wax, but this step is specified in Claim 5. The language of Claim 4 is the same as that of Claim 5, except that Claim 4 omits the step of "applying pressure to the set material" which is specified in Claim 5, and therefore, in my opinion, Claim 4 is not limited either in terms or by implication to the applying of pressure to the set material, but apparently is drawn to cover the broad idea of allowing the material to set for the purpose of obtaining a mold filled with wax-like

10

20

30

40



material in plastic condition, so that *any* desired operation may be performed upon the said material, and therefore when defendant allows the material in its mold to lose sufficient heat to become solidified and plastic and then performs an operation upon the material, defendant is allowing the material to set for the same purpose as that described in the patent, namely, the obtaining of a plastic body, and for this reason defendant's process in my opinion embodies the process set forth in the patent in suit and defined in Claim 4 thereof.

Referring to Claim 6, the first step of the process defined is the same as that of Claim 3; the second step is the placing of the mold in a water bath. As previously stated, the patentee places the mold in a water bath for the purpose of extracting the heat therefrom, so that the record becomes hard and contracts, so that the last step, namely the removing of the hardened casting longitudinally from the mold, may be accomplished. Defendant accomplishes this result by placing the mold first in a water bath, and afterwards in a blast of air. I consider that the use of the water bath followed by the air blast by defendant both for the purpose of cooling the record is precisely analagous to and equivalent to the use of the water bath as called for by the claim, and therefore, in my opinion, the defendant's process is a clear embodiment of Claim 6 of the patent in suit.

Cross-examination by Mr. MASSIE:

x-Q. 5. What is the meaning of the verb "casting" as used in the patent in suit, and particularly in Claims 3, 4 and 6?

A. The verb "casting" means the filling of the mold with the fused wax-like material.

x-Q. 6. With reference to the process and steps set forth by the three claims in suit, I understand

that the step of "casting" begins with the introducing of the molten material into the mold, and ends as soon as the last portion of the molten material has been so poured or otherwise introduced into the mold?

A. Yes, that is my understanding.

x-Q. 7. You appreciate, do you not, the difference between saying that two things or two steps are *identical*, and saying that the two are "equivalent?"

10

A. I understand the meaning of the word "equivalent" as used in the construing of patents, and believe it has a somewhat different meaning than the word "identical."

x-Q. 8. Am I correct in understanding your testimony to be that the claims sued on recite that the molten material is introduced into a mold that has already been heated—a pre-heated mold? That is, reading the claim literally, and with the interpretation of the word "casting" already given, and for the present disregarding the scope of the claim or any range of equivalents?

20

A. In the specification of the patent, the patentee describes the heating of the mold prior to the casting or pouring operation, but I do not consider that the language of the claims is limited in this particular and in my opinion the language of these claims is broad enough to describe a process in which the mold is heated before it is filled with material or after it is filled with the material. In other words, the language of the claim is broad enough to cover both ways of doing it.

30

x-Q. 9. It seems to me your answer disregards the request not to refer to the scope of the claim or "equivalents," and that a statement as to what the claim "covers" is not a direct answer to my question. I will divide the question up: You have said that the verb "casting" in these three claims means the filling of the mold with the material; now what

40



sort of mold does each of three claims say is thus filled with the fused material?

A. The kind of a mold is a hot seamless tubular record mold.

10 x-Q. 10. Still recalling that for the present I am not asking as to the scope of these three claims, and am disregarding any equivalents, is it not then true that these three claims, taken literally and according to the plain purport of the words used, recite that the mold must be pre-heated before the material is introduced?

20 A. It does not seem to me that the language of the claims is such as to require the use of a pre-heated mold, but on the contrary the claims are worded so that the first step of the process is the filling of a hot seamless tubular record mold with fused wax-like material at substantially the same temperature as the mold and the claims do not specify in any way whether the mold is heated before the material is introduced, or after it is introduced.

x-Q. 11. You say the first step of the process recited in the claims is the filling of the mold with the material; and that the mold which is thus filled with material is a "hot seamless tubular record mold?" Does that not mean that the mold which is thus filled is a *hot* mold?

30 A. The mold which is filled by the first step of the process is undoubtedly a hot mold, but it may be heated either before or after the material is introduced, as I understand the language of the claims.

40 x-Q. 12. If we take a cold mold and pour into it the fused wax-like material of the nature usually employed in this art, at the instant we have completed the pouring of the molten material and filled our mold, is that a hot mold or a cold mold; that is, at the immediate instant when we have just com-

pleted the pouring, have we filled a cold mold or have we filled a hot mold?

A. The temperature of the mold at the instant it becomes full would depend upon its original temperature, also upon the temperature of the material which was poured into it, and also upon the length of time which was occupied or consumed in the filling operation. If the mold were originally cold, that is, below the congealing point of the fused wax-like material, this material upon coming in contact with the surface of the mold would congeal in a thin layer upon the bore of the mold and if the filling operation was performed rapidly, there would still be this congealed material in existence at the instant the mold became full and we would not have a hot mold filled with fused wax-like material at substantially the same temperature as the mold, but would have a cold mold filled with material partly fused and partly congealed.

x-Q. 13. We would have a cold mold filled, but not with fused material; it would be filled partly with fused material and partly with congealed material?

A. That is correct.

x-Q. 14. Under the conditions recited in x-Q. 12 and your answer thereto, would you regard the operation of filling that cold mold as "casting?"

A. I should say that that would be a casting operation but not the casting operation called for by the claims of the patent.

x-Q. 15. If we take a cold mold (by which I understand a mold at what is called room temperature—about 70° F.) and pour into it within a second of time or less, the fused wax-like composition usually employed, at the instant we have filled our mold, why would not that be the step of casting called for by the claims in suit?

A. Because the claims call for a hot mold and

10

20

30

40



the casting within the same of fused wax-like material at substantially the same temperature as the mold. Such a casting operation results in a hot mold filled with completely fused material, whereas, the operation described by you would probably result in a cold mold filled with material partly fused and partly congealed.

10 x-Q. 16. Are you sure that if we take an ordinary record-mold at ordinary room temperature and fill it within a second or less with the fused wax-like composition of this art, that at the instant we have completely filled our mold we have not carried out the casting step of the claims in suit?

A. I am satisfied that you have not for the reasons which I have stated.

20 x-Q. 17. To make the matter sure I will repeat the last part of x-Q. 6: Is the "casting" step of the claims in suit completed at the instant the last portion of the fused material has been introduced into the record-mold?

30 A. Yes, when you use *a hot mold, that is, a pre-heated mold*, then the casting operation of the claims referred to is complete as soon as the last portion of the molten material has been introduced, but when you take a cold mold and fill it with fused wax-like material, then the casting operation has not been performed until the mold has become a hot mold; that is, one whose temperature is above the congealing point of the material, so that the mold may be filled with completely fused material instead of material partly fused and partly congealed.

x-Q. 18. Near the bottom of the second column of the patent in suit Joyce says that the mold and its core and base are slightly oiled and then heated, and that then melted wax is introduced. What is the purpose or result of the oiling?

40 A. The patentee does not state what is the pur-

pose of the oiling. It may be to facilitate the removal of the casting after the same has hardened. I do not consider that the oiling of a mold of this character is essential to the carrying out of the process of the patent, but suppose that the inventor considered it a desirable thing to do.

x-Q. 19. What effect, if any, would the heat of the mold and of the fused material have upon this oil?

10

A. That would depend upon what kind of oil was used.

x-Q. 20. For instance?

A. I have never made any experiments along this line and have not sufficient familiarity with the properties of oil to be able to elaborate upon this point.

x-Q. 21. What effect, if any, would the oil have upon the wax-like composition?

20

A. I can only answer that question in the same way that I did the last. I am not an expert on oils.

x-Q. 22. Are you aware of the fact that at the Edison Laboratory formerly at least, if not now, in casting blank cylinders the smooth bored molds were sometimes oiled before the molten material was introduced?

A. I have no knowledge upon that point.

x-Q. 23. And, of course, you do not know, if such were the case, whether or not those molds for blanks were cold?

30

A. No, I do not know.

x-Q. 24. Are you aware of the fact that in October, 1903, Mr. Edison in testifying for the National Phonograph Company in a suit then pending in the U. S. Circuit Court for the District of Connecticut against the present defendant on an Edison patent No. 713,209, in answer to x-Q. 52, after having referred to the use of oil as a lubricant in the molds for making blanks, said: "It was very

40



desirable to get rid of the oil because we wanted to use the scrap, and if the oil did get into the scrap, it deteriorated the quality of the blank?"

A. I was not present at the taking of the testimony referred to and was not connected in any way with the suit referred to, but I do find this statement in a copy of the printed record which you have just shown me.

10 x-Q. 25. Do you find any statement in the patent that the application of the oil may be dispensed with?

A. No, I do not find such a statement.

x-Q. 26. In view of your answer to x-Q. 18 is it your opinion that the treatment with oil is more than is necessary to produce the desired results in carrying out the process of the patent?

A. It is my opinion that the process of the patent can be carried out either by using oil or not, as one prefers.

20 x-Q. 27. That is, if the process of the patent can be carried out without the use of oil, then the use of oil is unnecessary, or, the use of oil is more than is necessary?

A. I do not consider the use of oil as being necessary, to the carrying out of the process, but I do not know that the reference to oil is a disclosure of more than is necessary to produce the desired results, but on the contrary I think the description of the use of oil was probably put in by the inventor in order to describe what he considered a desirable thing to do, but which other persons skilled in the art might consider undesirable.

30 x-Q. 28. In view of Mr. Edison's opinion quoted in x-Q. 24, are you prepared to say that the oil would not deteriorate the quality of the material in the cast record, and consequently, of the record itself?

40 A. The oil mentioned by Mr. Edison is castor oil and I do not understand that he refers to other oil

or oils generally, but I have no knowledge upon which to base an opinion as to the effect of castor or any other oil on the wax-like material.

x-Q. 29. The specification of the patent in suit, in lines 103-104 of the first page, after describing the application of oil to the mold, and saying the latter is then heated, preferably, to near the temperature of melted wax, adds: "This heating expands mold H slightly." What significance, if any, does this quoted sentence convey to you as an expert in this art?

A. I cannot say that it has any particular significance to me; the mold is of metal such as copper, and an increase in temperature will expand it.

x-Q. 30. It would seem that the patentee might take it for granted that the heating of a metal mold to about the temperature of the melted composition would be known to have the result of expanding the mold, so that there would be no necessity for making this statement; and that the statement that this heating "expands mold H slightly," followed by the succeeding statement: "then melted wax L is poured into the hot mold, etc.," taken in connection with the entire specification, has some significance to the expert who reads this patent. Can you make any further answer to my question as to the significance of this?

A. Some people might not know that the heating of a copper mold would expand it, and I regard this statement as gratuitous information on the part of the patentee.

x-Q. 31. What is the purpose of employing a hot mold? And what is the result?

A. I do not think I can state the purpose and result more clearly than I have stated in answering Q. 3; see 14th paragraph of that answer.

x-Q. 32. As I read the previous answer referred to, you understand the purpose of the hot mold to

10

20

30

40



be to prevent air bubbles; is that correct?

A. It prevents flaws upon the surface of the record due to the presence of air.

x-Q. 33. Do you find any statement to this effect in the Joyce patent; if so, where, and if not, what is your authority for your answer?

10 A. I do not find this matter stated in the patent in this language, but the patent discloses a tubular mold having a core, and this mold is originally empty; that is, filled with air, which is a part of the atmosphere in which we live. In order to cast material in the mold it is necessary that this air be displaced by the material which is used to form the casting and unless the air is entirely displaced so that there will be no air in contact with the bore of the mold at the time the material congeals and solidifies, a defective casting will be produced.  
20 The use of a hot mold, that is one above the congealing point of the fused material, permits the entire contents of the mold, and particularly the wax-like material in contact with the bore of the mold to be fluid, as distinguished from congealed, and because of this fact, air which has been entrapped by the wax-like material is given an opportunity to escape; the air being lighter than the fused material, rises to the top, whereas if the material were congealed the air could not escape in this manner, and when the casting has hardened  
30 and was removed from the mold there would be a depression, hole or flaw on the surface of the casting, which would make it entirely unfit for use as a phonogram or sound record.

x-Q. 34. Your answer does not seem to be entirely responsive. You seem to say that if air were trapped against the record-surface of the mold, the resulting record would be defective; therefore the employment of a hot mold is to prevent this.  
40 But how do you know that air *would* be trapped

if you employed a cold mold, and yet with the same wax-like composition introduced into a hot mold, air would *not* be trapped?

A. The cold mold causes the fused material to congeal as soon as it strikes it, and it is the congealed material that traps the air, because the air cannot escape through solid material, but it can and does escape through fused material, and by using a hot mold the entire body of wax within the mold may be in a fused condition. 10

x-Q. 35. During the several years that you were connected with the Patent Department of Mr. Edison, of the National Phonograph Company, I understand that you were familiar with the making of molded sound records as carried on commercially on a very large scale?

A. That is true; I have often seen them manufactured.

x-Q. 36. During about what period does your observation of the commercial production of molded sound records extend? 20

A. From about the beginning of the year 1904 to about the present time.

x-Q. 37. Does this complainant, the New Jersey Patent Company, make any sound records or is the work done by the National Phonograph Company?

A. I am not connected with either of the companies mentioned, so that I am unable to say. 30

x-Q. 38. You do know that the National Phonograph Company has carried on the manufacture of such articles commercially on a large scale.

A. I have understood that the factory operations that I witnessed were those of the National Phonograph Company.

x-Q. 39. Now, in the factory operations which you have witnessed during the period of your connection with the Patent Department of Mr. Edison and his company, was the mold, before the molten 40



wax-like material was introduced, cold or hot?

10 A. The mold used was cold and was open both at the top and bottom. It was filled with material by being lowered into a bath of fused wax-like material, which material congeals as soon as it came in contact with the interior surface of the mold. It was not allowed to come in contact with the exterior surface of the mold, as the mold was supported by a sort of a cylindrical can, which kept the wax away from the exterior of the mold. There was no trapping of the air contained in the mold, because the mold descended into the material with a well-regulated uniform movement; there was no splashing of the wax and the air was driven out of the mold by the surface of the ascending wax so as to pass out of the top of the mold into the atmosphere. After the cold mold had been in the bath a sufficient length of time, it was removed therefrom and there was a congealed layer of wax within the mold and adhering thereto, of sufficient thickness to form a sound record.

20 x-Q. 40. The process and apparatus you have referred to are substantially those set forth in United States Letters Patent 683,615, granted to Miller & Aylsworth, Oct. 1, 1901, and 683,676, granted to Aylsworth & Miller Oct. 1, 1901, are they not?

30 A. In my opinion they are.

x-Q. 41. Do you know about the congealing point of the record-composition usually employed?

A. It is in the neighborhood of 290 or 300 degrees Fahr.

40 x-Q. 42. Assume a mold of about room temperature, and to be more definite, I ask to assume a mold such as was described by complainant's witnesses, Weber and McCoy; and assume that the composition whose congealing point is about as just stated by you, but that the said material has

been superheated to between 450 and 475 degrees F.; then assume that this superheated material is poured into such mold within a second of time or less (I do not mean to be precise in indicating the time, but wish you to understand that the composition is to be poured in the mold as rapidly as may be, and not drop by drop); what can you say as to the temperature of that portion of the composition adjacent the surface of the mold; would it be congealed or not? 10

A. I have not made any experiments to determine what would be the temperature of the material adjacent the mold under the conditions which you have specified, but whatever experience I have had with hot wax, such as the ordinary phonogram composition at a temperature of 300 degrees F., and with a wax-like material, such as hot candle grease, has shown me that I could not introduce a cold metallic body into such melted material and withdraw it without its receiving a coating of congealed material, no matter how quickly I did it. In superheated material I have no doubt but that if the cold mold were left in contact with the superheated material for a short time, the congealed material would become fused, that is, after the mold had become hot, but I do not know the exact length of time that would be required to accomplish this result. 20

x-Q. 43. In the conditions I am assuming, our wax-like composition is at a temperature of 150 degrees F. or more *above* its congealing point, and is being poured or otherwise introduced as rapidly as may be into the mold, which is not artificially chilled, but is at ordinary room temperature. Would not the extremely high temperature of the body of the molten composition counteract the tendency of the metal mold to congeal the outer portion of the wax, so that at the instant the mold 30

40



has been filled its entire contents are still liquid, while the mold may have been somewhat raised in temperature?

10 A. I do not think so. The entire body of melted material is not in contact with the surface of the mold. The mold is of metal and abstracts heat very rapidly from the material with which it comes in contact, metals being excellent conductors of heat. On the other hand, a wax-like composi-  
tion, such as that used for making phonograph records, would not be able, in my opinion, to supply heat from its interior fast enough to prevent the congealing of its exterior under the conditions specified.

20 x-Q. 44. I notice that the patent in suit, for instance in claim 4, names two different steps or things, viz.: (1) "allowing the material to set," and (2) "cooling the mold and contents." What is the difference, if any, between these two things?

30 A. Referring to claim 4, the step specified as "cooling the mold and contents," is followed by the words "so as to cause the material to shrink away from the record surface of the mold." When the fused material within the mold reaches its congealing point, it congeals, or solidifies, or sets; that is, it passes from liquid to solid condition. This is the first step of the cooling operation of claim 4. The mold and contents are then cooled to a lower  
40 temperature and the material which has first set, then hardens and contracts or shrinks, so that the diameter of the record becomes less than the interior diameter of the mold, since the record in cooling shrinks to a greater extent than does the mold. The material of the record therefore, in the language of the claims, shrinks away from the surface of the mold, and this further cooling, which produces a contraction of the record, is the second step of the cooling operation of claim 4.

x-Q. 45. Do you recognize any distinction between "cooling the mold" and "allowing the mold to cool?" in connection with the process set forth in claim 4?

A. The language of the claim is "cooling the mold, etc." I do not find the language "allowing the mold to cool" in the claim, but I consider that cooling the mold means or includes allowing the mold to cool.

10

x-Q. 46. You observe, do you not, that when the "casting" step is completed, the patentee holds his hands off and does nothing, leaving the material to lose its temperature of itself so as to become "set;" and that thereafter he then becomes active again and does something, viz.: immersing the whole in a bath of cold water, or passing cold water through the hollow core, or employing other "cooling means." In view of this, would not the two steps quoted from claim 4 indicate to you that "allowing the material to set" means "do nothing to your apparatus after you have performed the step of casting, but let it stand until the material has congealed"; whereas the step of "cooling the mold, etc." (which is not recited as "allowing the mold, etc., to cool") means that you must apply some positive operation for cooling?

20

A. No, I do not gather from any language used in the specification, which, however, is not the same as that used in your question, that the cooling operation of claim 4 requires the application of some rapid cooling means, such as for example, placing the mold in a water bath called for by claim 6; if the filled mold is surrounded by air, at ordinary room temperature, and left for a sufficient period of time, the air will cool the mold and contents so as to cause the material to shrink away from the record surface of the mold, but it will of course, take a very much longer time to produce this result

30

40



than would the application of a water bath. But in either case, one would be cooling the mold and contents in my opinion within the meaning of claim 4.

10 x-Q. 47. I assume that you regard the patentee as saying he may make records by the employment of mechanical pressure applied to the semi-plastic material, and he may also make records without resorting to mechanical pressure. If we suppose a case of the latter process only, then what purpose or result do you attribute to the employment of the two different steps recited in claim 4, viz.: (1) "allowing the material to set," and then (2) "cooling the mold, etc.?"

20 A. The allowing of the material to set produces a casting which is still warm and soft and tightly held by the mold. It is possible at this time to perform mechanical operations of various kinds upon the material while it is soft and plastic, which could not be accomplished after it has hardened. If the cooling operation be suspended at this time, it will allow a person to take advantage of the material being in an easily workable condition, which it would not be when completely cooled and in my opinion, claim 4 contemplates dividing the cooling operation into two steps, so as to permit any mechanical operations to be performed upon the casting while it is soft and held by the mold, such for  
30 example, as the application of mechanical pressure thereto, as described in the patent, or the reaming out of the bore of the casting as practiced by defendant, or any other desired mechanical operation.

x-Q. 48. How does the patentee direct us to "suspend the cooling operation" when the material becomes set?

40 A. The patentee, after the material has become set, or partly set, performs a mechanical operation

thereon, which consists of the screwing down of the tapering core K into its base I, and after this, says that the "mold and contents may now be cooled immersing all in a bath of cold water, etc." Of course, the mold and contents will still be losing heat while this mechanical operation is being performed, and the cooling operation is perhaps not "suspended," but is *prolonged*, and the application of the cold water bath is *postponed*, and the entire period of cooling is prolonged. This is similar to defendant's cooling operation, which is also suspended or prolonged by stopping the first cooling step, then performing a mechanical operation upon the record while still slowly cooling, and then resuming the rapid cooling by means of an air bath.

x-Q. 49. Suppose not only that mechanical pressure is not to be applied, but also, that no other mechanical treatment is to be applied to the article during its plastic or semi-plastic state, then what advantage, if any, can you perceive in having the two steps referred to, first allowing the material to set, and subsequently cooling, etc.?

A. In such a case I cannot see that there would be any advantage in performing the cooling operation in two steps as distinguished from a single step, because one would not be making use of the properties of plasticity and softness which are present in the casting at the time it sets and before it has become cold and hard.

x-Q. 50. If the particular process comprise the step of applying mechanical pressure after the material has become set, but while it is still plastic or semi-plastic, then the language of claim 4 is quite appropriate, is it not; and the purpose of having the two steps in reduction of temperature quite obvious?

A. The process which differs from that described in claim 4 only by the fact that pressure

10

20

30

40



same order or sequence, and accomplishing the same results in the same way. In other words, that defendant's process is identical with that of claim 3.

x-Q. 55. The same question as to identity or equivalents with the process of claim 6 and defendant's process?

10 A. In my opinion, defendant's process differs from that of claim 6, in that defendant's cooling operation is performed by placing the mold in a water bath, removing the same therefrom and completing the cooling operation by placing the same in a blast of air. In claim 6 the cooling operation is accomplished by placing the mold in a water bath. I consider the use by defendant of a water bath, followed by an air bath, as equivalent to the use of the water bath specified in claim 6.

20 x-Q. 56. The same question as to claim 4 and defendant's process?

A. I regard defendant's process as identical with that of claim 4.

x-Q. 57. Do you understand the testimony in this case to be that defendant first allows its molten material cast into the mold to become set, and then subsequently cools the mold and its contents sufficiently to permit the latter to shrink away from the mold?

30 A. As I understand defendant's process, the hot mold and contents are placed in a water bath and the material allowed to set; the mold is then taken out of the water bath and after a mechanical treatment of the plastic body within the mold, the mold and contents are then cooled by an air blast so as to cause the material to shrink away from the record surface of the mold, and the hardened casting is then removed longitudinally from the mold.

40 Adjourned.

June 14, 1907.

Met pursuant to adjournment.

Present:

MR. DYKE, for complainant.

MR. MASSIE, for defendant.

Cross-examination of Mr. Holden by Mr. MASSIE  
continued:

10

x-Q. 58. According to your views, when the fused material is introduced into a cold mold there is more or less tendency to trap air bubbles against the surface of the mold, and a heating of the mold will liquify the otherwise congealed material adjacent to the record-surface, and thus permit these air bubbles to escape; whereas, when the fused material is introduced into a hot mold the material does not congeal against the record-surface. If I have correctly stated your opinion, how long must the material remain liquid in order to permit these air bubbles to escape; and what information does the Joyce patent give us upon this subject?

20

A. I have not witnessed the process of producing sound-records set forth and claimed in the Joyce patent, and have therefore not been able to measure the time required for the escape of the air bubbles. The Joyce patent is silent upon this point.

30

x-Q. 59. What I am trying to find out is, whether some appreciable time would be necessary for the escape of air bubbles when the melted composition has been poured into the mold of about the same temperature; or, under such conditions, will practically all of the air bubbles have passed away from the surface of the mold by the time the latter is completely filled?

A. It requires an appreciable time for air bub-

40



bles to move through any liquid, and the speed with which they move varies both with the specific gravity and mobility of the liquid. I cannot say exactly how much time would be required for air bubbles to escape from the fused wax-like material. It would vary somewhat with the temperature of the material, because the mobility of the fused material varies with its temperature, and  
10 I have never made any experiments in measuring the time required for the escape of air bubbles.

x-Q. 60. The patent in suit says that (before the wax is poured into the mold) the mold is heated to near the temperature of melted wax. Do you understand that to mean the temperature at which the wax melts or congeals?

A. I consider that the language of the specification means that the mold is heated to a temperature equal to or above the congealing point of the wax-like material, and that it may be heated to a temperature considerably above the congealing point  
20 of the wax if desired. For example, if the fused wax-like material is of a temperature of 400 degrees F. the mold may be heated to this temperature, or it may be between this temperature and the congealing point of the material, or it may be at a higher temperature than the wax-like material, in which latter case the material would soon bring the temperature of the mold down to the temperature  
30 of the fused material, and in all these cases the result would be either immediately or within a short time the casting within a hot seamless tubular record mold of fused wax-like material at substantially the same temperature as the mold.

x-Q. 61. In the passage referred to, in line 102, occurs the word "preferably." To what does this apply? Does it mean that preferably the mold is heated, though it need not be heated, or does it  
40 mean that the mold must be heated, and is prefer-

ably heated to the temperature indicated?

A. Some of the claims of the patent, for instance claims 1 and 2, are not limited to a casting operation in which the mold is necessarily heated. I should say that the word "preferably" is intended to apply to the verb "heated," in line 102 of page 1 of the specification.

x-Q. 62. So that the patentee discloses, in addition to that modification in which he employs a mold which is heated (either beforehand or after it has been filled with the fused material) another modification in which the mold is not heated otherwise than what may be due to the introduction of the heated composition, provided in such process could be applied to the inner surface of the core?

A. The patentee states that the mold is "heated, preferably," which I understand means preferably heated. In carrying out the process of claim 1, which I understand is not involved in this suit, the mold may or may not be heated, at the option of the person practicing the process, and I should say that there are claims in the patent which are not involved in this suit which do relate to another modification of the invention.

x-Q. 63. The patent, in the same passage, says that the temperature imparted to the mold is near the temperature "of melted wax," which seems to be in a general form, as distinguished from saying "the temperature of *the* melted wax." Does this indicate to you that the patentee intends a certain definite temperature which he indicates as "the temperature of melted wax"; or does he refer to whatever may be the temperature of the particular melted composition employed?

A. It does not seem to me that the language employed in the patent means that there is a certain definite temperature which is defined as the temperature of melted wax, because melted wax

10

20

30

40



may be at a temperature just above its congealing point, or it may be at a considerably higher temperature. The melted wax may exist at a temperature of 150 degrees F. above its congealing point, or even hotter than this, without decomposing. So that the language used is apparently not intended to differentiate in this respect from the words "the temperature of the melted wax."

10    -x-Q. 64. In the art of casting, in order to produce the cast article or "a casting," is it necessary that the material be in a fused condition? The question is not limited to the particular process of the patent in suit.

20    A. I do not understand whether you refer to the art of casting ordinary objects as practiced many years prior to the invention of phonograms, or whether you refer to the art of casting phonograms, which I regard as a different art from that first mentioned by me. In both of these arts, however, all of the casting operations that I have ever witnessed have been with fused material, and I do not know whether or not it would be possible to cast with material which is not fused. Possibly there may be materials which could be cast in a semi-fused condition, but I do not know.

30    x-Q. 65. My question was not limited to the casting of phonograms. For instance, I have heard of "plaster casts" in which plaster of paris, for instance (which I understand does not fuse) is caused to receive an impression of a mold, and is then allowed to set and become hard. Do you regard that operation as "casting?"

40    A. Claims 3, 4 and 6 of the patent in suit specify the casting of a fused material, and I should not consider the making of a plaster of paris cast as the casting of a fused material. But I see no objection to calling it a casting operation, if one so desires.

x-Q. 66. I understand that cylindrical sound-records have been made by the use of another semi-plastic material (celluloid). If this be done without the aid of mechanical pressure, the celluloid being rendered semi-plastic by heat or a solvent or both, would you regard that operation as "casting?"

A. I am not sufficiently familiar with the properties of celluloid when subjected either to heat or to solvents or both to be able to answer that question. 10

x-Q. 67. Will you please give a definition of the verb "casting," when employed to produce cast articles, not limiting the definition to the invention of the patent in suit, but speaking broadly?

A. This word is an ordinary English word, and is defined in all unabridged dictionaries. I do not feel that I can improve upon our standard lexicographers.

x-Q. 68. Is the process described by you in answer to x-Q. 39, in which the open ended mold is lowered into the molten material, which rises through the bottom of the mold, a *casting* process? 20

A. I should call it one.

x-Q. 69. What material did the patent in suit direct or contemplate the use of?

A. The patent states, on page 2, lines 18 and 19, that the wax is of usual phonogram compound, and in lines 44 to 46, same page, "where I have indicated a 'wax' phonogram it must be understood as applying to a phonogram of plastic material." 30  
And in lines 49 to 54 of the same page, "My duplicates may be made of any fusible substance used for phonograms, provided the shrinking of the material of the expansion of the metallic shell permits the withdrawal of the duplicate from the mold."

x-Q. 70. Is it not the fact that Joyce does not specify any material, and does not disclose any new 40



composition, but merely leaves us to use any so-called "wax composition" or other "fusible substance" used for phonograms, provided the same should have sufficient shrinkage properties—leaving the one undertaking to carry out the process to select from the materials known in the art at the date of the Joyce patent?

10 A. Joyce does specify a material adapted to carry out his process, namely "usual phonogram compound," which I understand means the material usually employed in making phonograms at the date when Joyce filed his application for patent. But the patentee does not limit himself to the use of this particular material, as shown by the language which I have quoted in my last answer.

x-Q. 71. Do you know what was the composition usually employed at the date Joyce filed his application?

20 A. At the date mentioned I was not familiar with the material or materials used in the casting of phonograms, but I have since been informed that there was a material usually employed for their manufacture, which is a fusible wax-like material, consisting largely of metallic soap and stearic acid.

30 x-Q. 72. Are you aware of the fact, or have you been informed, that in the suit named in x-Q. 24, Mr. Edison testified in October, 1903, and stated that he and his associates were unable to produce sound-records commercially by the casting process until the production of the Aylsworth (or Aylsworth & Miller) compound?

A. No, I am not aware of this, nor have I been so informed to my knowledge or recollection.

40 x-Q. 73. Are you prepared to state, either of your own knowledge, or upon information, that there was any composition known in the art at the date that Joyce filed his application for the patent

in suit, which could be employed in carrying out any casting process disclosed by the patent in suit, with sufficient success to produce cast sound-records commercially?

A. A few months ago I witnessed some casting operations carried out in accordance with the process referred to by me in answer to x-Q. 39, in which a cold mold and several fused wax-like materials were used, and one of the materials used was what was called regular blank wax, which means the wax used for making cylinders suitable for being engraved into a phonogram by a phonograph recorder, and I was informed that this regular blank wax was a material which was known and used for the production of phonogram blanks prior to the filing date of the Joyce patent, and was the usual phonogram compound used at that time for the commercial production of blanks from which phonograms were to be made. The casting operations which I witnessed produced quite a large percentage of good phonograms or sound-records; I do not remember the exact percentage of the good and bad ones, nor do I know what percentage of good ones is necessary to constitute commercial success, either at the present time or at the date of the filing of the Joyce application. I did not see this regular blank wax used to carry out the process of Claims 3, 4 and 6 of the patent in suit, but from what I did see I am satisfied that it could be successfully used for this purpose, and that a large percentage of good phonograms would be produced.

The words "but from what I did see I am satisfied, etc.," to the end of the answer, objected to as incompetent.

x-Q. 74. Are you prepared to say that if the fused material be poured into a record-mold of substantially the same temperature as the material,



and the material allowed to set, without the application of additional heat or of any means for maintaining the temperature, that the air bubbles would pass away from the record-surface; and that satisfactory sound-records would be produced?

10 A. Under the conditions specified I believe that the air bubbles would leave the record-surface of the mold, and that satisfactory sound-records would be produced. I see no reason why this should not be so, and I have previously stated the reasons why I believe it would be so.

x-Q. 75. So far as you know, has the complainant herein or the National Phonograph Company, or whatever concern at Orange makes sound-records, ever made sound-records in accordance with any process set forth by the Joyce patent in suit?

20 A. I have never witnessed at Orange, or elsewhere, the carrying out of the process of Claims 3, 4, 5 or 6 of the patent in suit, and I have not given sufficient study to Claims 1 and 2 of this patent and drawn upon my somewhat dim recollection of experimental work which I have seen at Orange, to be able to say whether or not I have ever seen the carrying out of the process of Claims 1 and 2 of the patent in suit.

30 x-Q. 76. Is it not the fact that in carrying out the process set forth by the claims in suit, at the instant the mold is filled it is *hot*; and in carrying out defendant's process, at the instant defendant's molds are filled they are comparatively *cold*?

40 A. In carrying out the process of the claims in suit the first step of the process has been carried out as soon as one has obtained a hot seamless tubular record mold filled with completely fused wax-like material at substantially the same temperature as the mold, and the mold at this time is hot; but the claims do not require that this condition shall exist instantly upon the filling of the mold. In the process practiced by defendant this

condition exists prior to the time when the filled molds are removed from the tank or kettle of fused material, but the exact instant when defendant's molds pass from the state of being a cold mold into that of a hot mold depends upon the speed with which they receive heat from the fused material, and in practicing this process it would be easily possible for the molds to become hot molds before they are filled with the fused material, because they are closed at the bottom, and lowered into the superheated material while in a vertical position, so that the material does not enter the mold until it flows over the top of the mold. If the molds are lowered into the fused material slowly, they would become hot molds before the material enters them, so that the question as to whether they are hot molds or cold molds depends upon the length of time which elapses between the submerging of the bottom of the mold and the top of the mold. It is, however, immaterial, in my opinion, whether the mold be heated before any of the material enters it, or after, so long as there is a period when the mold is hot and filled with completely fused wax-like material at substantially the same temperature as the mold, as I have previously explained.

x-Q. 77. In carrying out the process recited in your answer to x-Q. 39, where the open-ended mold is lowered into the molten material with a well-regulated uniform movement, and is allowed to remain in the bath "a sufficient length of time," is it then a hot mold or a cold mold?

A. In practicing the process referred to, the mold is cold when it enters the wax, and is kept cold while in the wax, a water jacket surrounding the exterior of the mold during the time the mold is below the level of the wax, and the mold remains at all times cold, that is, below the congealing point

10

20

3)

40



of the wax, and does not become a hot mold at any time.

x-Q. 78. You will admit, will you not, that the thing which the Joyce claims in suit takes for the purpose of filling is a *hot* mold, and the thing which defendants take in order to fill it is a *cold* mold?

10 A. No, the claims in suit do not specify a pre-heated mold, and one may practice the process of these claims by taking a cold mold and submerging it in hot material until it becomes a hot mold filled with the fused material, or he may lower it so slowly into fused material that it becomes a hot mold before the material enters it. I understand, however, that the mold used by defendants is a cold mold before it is heated, but the exact time when it ceases to be a cold mold and becomes a hot mold is unknown to me except that it becomes a  
20 hot mold before it is removed from the wax kettle at which time it is undoubtedly a hot mold filled with completely fused material.

x-Q. 78. Do you find any statement or suggestion in the patent in suit which directs or hints at *maintaining* the heated condition of the material after it has been introduced into the mold, or the imparting of additional heat to the material and the mold?

30 A. The specification of the patent in suit describes a process in which a hot mold is filled with completely fused wax-like material at substantially the same temperature as the mold. It does not state that heat is applied to this mold for the purpose of maintaining the mold and contents in a heated condition for any given length of time, but heated bodies do not lose heat instantly, and the wax-like material mentioned in the patent parts with its heat slowly when surrounded by the at-  
40 mosphere at room temperature, and there would,

therefore, be an appreciable time after the hot mold is filled with fused material before either the mold or its contents reaches the congealing point of the wax, sufficient at least for the escape of air bubbles from the record-surface of the mold.

End of cross-examination.

Signature and certificate waived.

Adjourned subject to new notice.

10

Counsel for complainant gives notice of the closing of his *prima facie* case.

20

30

40



## DEFENDANT'S PROOFS.

IN THE CIRCUIT COURT OF THE UNITED  
STATES.

Southern District of West Va.

10	NATIONAL PHONOGRAPH CO.	In Equity, on Miller & Aylsworth Patent No. 683,615.
	<i>vs.</i>	
	AMERICAN GRAPHOPHONE CO.	
	NATIONAL PHONOGRAPH CO.	In Equity, on Aylsworth & Miller Patent No. 683,676.
	<i>vs.</i>	
20	AMERICAN GRAPHOPHONE CO.	
	NEW JERSEY PATENT CO.	In Equity, on Joyce Patent No. 831,668.
	<i>vs.</i>	
	AMERICAN GRAPHOPHONE CO.	

New York, January 3, 1908.

30      Testimony for defendant, taken at the office of  
Philip Mauro, Esq., 154 Nassau Street, New York  
City, N. Y., before Ralph L. Scott, Notary Public  
in and for the County of New York, acting as Spe-  
cial Examiner by consent, on Friday, January 3,  
1908, at 2 p. m.

Met pursuant to agreement.

Present:

HERBERT H. DYKE, Esq., for complainant;  
40      PHILIP MAURO, Esq., for defendant.

It is stipulated and agreed by and between counsel for the respective parties as follows:

1st. That the three cases entitled above shall be consolidated as far as concerns the taking of proofs.

2nd. That either party may introduce any deposition or depositions, or any exhibit or exhibits in the suits which were brought in the United States Circuit Court for the District of Connecticut by the National Phonograph Company against the American Graphophone Co. based respectively on Edison molded record patents Nos. 667,662 and 713,209, subject to any objections that may be offered as to their materiality, etc.

3rd. It is stipulated and agreed that printed official copies of U. S. patents and British patents may be introduced in evidence with the same force and effect as if duly certified, and that the date of filing printed on copies of the U. S. patents shall be taken to be the correct filing date, subject to proper correction of inaccuracies, if any.

Pursuant to the foregoing stipulation, counsel for defendant offers in evidence as part of defendant's proofs herein, depositions of E. E. Norton, T. H. Macdonald, A. A. Stevenson, F. H. Osborne, taken in the suits entitled above on January 13 and 14, 1903. Also Defendant's Exhibit, Photograph 1895 Mold, Defendant's Exhibit, Photograph 1899 Mold, No. 1 and No. 2.

Counsel for defendant states that the molds whereof these exhibits are photographs, are now in evidence in a suit between William Herbert Smith and the American Graphophone Co., pending in the Supreme Court of the District of Columbia, and defendant's counsel wishes to reserve the right to introduce the same in this case if available at any time before the hearing.

Defendant's counsel also offers in evidence, as an exhibit for defendant herein, the deposi-

10

20

30

40



tion of Thomas A. Edison, Esq., taken in the above-entitled suits at West Orange, New Jersey, Oct. 9, 1903.

It is agreed that counsel for complainant shall have the right after an investigation, to enter objections if so desired, to the foregoing portions of the record of the Connecticut cases.

10 And thereupon THOMAS H. MACDONALD, a witness produced on behalf of defendant, being first duly sworn, deposes and says as follows:

Q. 1. Please state your name, age, residence and occupation?

A. Thomas H. Macdonald; age, forty-eight; residence, Bridgeport, Conn.; occupation, Manager of the Factory of the American Graphophone Co.

Q. 2. Are you the same Thomas H. Macdonald who invented the molded record process patented in patent No. 682,991?

20 A. I am.

Q. 3. And the same Thomas H. Macdonald who gave a deposition in the molded record suits on the Edison patents?

A. I am.

Q. 4. You have already given a deposition for the complainant in the above-entitled suit based on the Joyce patent, for the purpose of identifying the process in use at defendant's factory during the period covered by the complaint herein. I understand that substantially the same process has been  
30 used by the defendant throughout the period covered by these cases, to wit, from Oct. 1, 1901, down to the present time. Is that correct?

A. That is correct.

Q. 5. What are the salient or essential steps which are practiced in making sound-records by the defendant's process (hereafter to be understood as the process in use at defendant's factory during the period above specified)?

40 A. The first step is to fill the mold with the

liquid or molten wax. The mold and the wax are then raised to a temperature substantially above the melting point of the wax. It is allowed to remain at this temperature for a definite period of time until all ebullition or bubbling has ceased and the wax is thoroughly limpid. It is then removed and the mold is immersed in cold water. As the second step, chilling the mold (and consequently the wax in contact with it) from the outside. The next step is to remove the core, and after this the surplus material in the center of the wax mold is removed by a scraper, and the mold is then chilled down to normal temperature by being placed in an air blast. The molded record is removed, the ends cut off, and when entirely cold, usually the next day, it is placed in a machine which holds it on the outside on each end. It is then reamed the size to fit the mandrel of the talking-machine, and is then ready for the market.

Q. 6. In the molding operation, as you have described it, have or have not the three steps of (1) superheating the melted material while in the mold, (2) maintaining the superheated temperature, (3) suddenly and symmetrically chilling from the outside, been always practiced in the manufacture of molded records by the American Graphophone Co.?

A. They have.

Q. 7. How high above the melting point of the wax-like material is it heated?

A. From 120 to 150° Fahrenheit.

Q. 8. How long on an average is this superheated temperature maintained?

A. About five minutes for each mold.

Q. 9. Is it possible, according to your experience, to obtain commercial molded records by your process without employing these three steps enumerated above?



A. It is not.

Q. 10. How much attention have you given to practical experimentation with reference to the production of molded records?

10 A. I have devised the various processes used by the American Graphophone Co. and have directly supervised their operation in the making of many millions of records during the last seven years. I have carried on continuous experiments for a space of nine years and have tried every process I could think of. I have been engaged directly in experimenting on this work almost daily during that time.

Q. 11. Who has devised the machines and processes employed by the American Graphophone Co. in the manufacture of talking machines and sound-records during the past fifteen years?

20 A. I have.

Q. 12. Have you read the specification of the Miller & Aylesworth patent in suit No. 683,615?

A. I have read it.

Q. 13. Do you understand the process described and claimed in that patent?

A. I do.

Q. 14. Does the American Graphophone Co. use the process described and claimed in that patent, or has it ever done so?

30 A. They do not use it and they have never done so.

Q. 15. You have stated that it is essential for the production of a sound-record by your process that the temperature of the wax should be raised to about 150° or more above its melting point; how is it with reference to the temperature of the wax in the Miller & Aylsworth process?

40 A. It is necessary in this process, that is, the Miller & Aylsworth process, that the temperature of the wax should be maintained at a point barely

above the melting point—just slightly more than the melting point.

Q. 16. With reference to the temperature of the mold, what is necessary in the Miller & Aylsworth process, and compare it with your process in that respect?

A. In the Miller & Aylsworth process, it is necessary that the temperature of the mold should always be less than the melting point of the material. It must never be equal to or above it at any time. This is made necessary from the fact that the process utilizes this cold mold for chilling the material and setting it the instant it touches the surface of the mold. In the process which I have devised and used in the American Graphophone Co., the mold is heated to a point approximately 150° above the melting point of the wax. The mold is allowed to remain in this state, also the wax, for a period of about five minutes, this for the purpose of allowing the wax to become limpid and all bubbles to rise.

Q. 17. In the Miller & Aylsworth process, what would happen if the mold were left in the vat until heated above the temperature of the melted wax before it was withdrawn?

A. They would not obtain a record if the mold were allowed to come to the temperature of the wax, for the wax will not congeal on its surface, and when lifted out the wax would run back to the vessel. There would be no record.

Q. 18. What is necessary in carrying out the Miller & Aylsworth process with reference to the duration of the time the mold is allowed to remain in the melted material, and compare with your process in that respect?

A. In the Miller & Aylsworth process the mold must remain but a short time in the material. If it were allowed to remain a substantial time the mold



would become the same temperature as the melted material. There would, of course, be no chilling or coagulation of the material upon the surface of the mold, and so there would be no cast or record. It is therefore necessary to remove the mold before it can be heated up to the melting-point temperature of the wax. In my process, used by the American Graphophone Co., the mold is left in the material until the entire mold and its tray which holds it, is raised to the temperature of the superheated wax. It is then removed, the mold acting as a cup for holding the melted wax is placed in water which chills it, and thus produces the molded record.

Q. 19. In the Miller & Aylsworth process is it essential that the record forms,—that is, that the material solidifies while the mold is in the vat?

A. It is, in their process; the sound-record is actually formed and completed while the mold is immersed or in the liquid wax.

Q. 20. In your process, is it possible to do this even if you wanted to?

A. It is not possible to do it even if I wanted to. The molded record in my case must be formed after the mold is removed from the melted material. It is actually made during the process of solidifying in the cold water.

Q. 21. In the Miller & Aylsworth process is it necessary to insert the mold in the melted wax in a particular way, and if so, in what way; and compare with your process in that respect?

A. In the Miller & Aylsworth process it is necessary to immerse the mold in the molten wax in such a manner that the wax will flow up and along the bore of the matrix smoothly and uniformly. If this is not done, rough spots and blasts would appear upon the surface of the record, as the material chills practically the instant it touches the surface of their cold mold. In my process, used by the

Graphophone Co., the material is thrown in the mold in any convenient way. In actual practice it is filled by dropping the mold six to eight inches below the surface of the wax and allowing the material to flow in over the top as rapidly as it can. This is possible from the fact that the material does not congeal when it strikes the sides of the mold. But the mold being raised in temperature by the superheated material, the liquid wax is brought in contact with every part of the surface to be chilled afterwards in the cold water bath.

10

Q. 22. In practicing the Miller & Aylsworth process, is it necessary to protect any part of the surface of the mold; and if so, please compare with your process in that respect?

A. In the Miller & Aylsworth process it is necessary to protect the outside of the mold and to keep it away from the melted wax, otherwise the wax on both sides of the mold would heat it to such a point that the material would not congeal on the bore, the material being allowed to touch the inside of the mold only. In my process just the reverse is true. We desire the hot liquid wax to be brought against the outside of the mold for the purpose of raising the temperature of the mold itself well above the melting point of the wax.

20

Q. 23. In Claims 3, 4 and 5 of the Miller & Aylsworth patent, which are the Claims involved in this suit, reference is made to immersing a mold in molten wax-like coagulative material, whereby the material will accumulate on the bore of the mold. What method of immersing the mold in wax is described in this specification whereby the specified result is accomplished?

30

A. I take it that this means that the mold is lowered slowly into the wax-like material, allowing it to flow uniformly and evenly along the bore of the mold, congealing as it meets the surface, be-

40



ing then withdrawn before the mold has time to acquire the temperature of the wax. But this expression of immersing the mold, as quoted in the patent, does not seem to me to describe the process, at least as I understand immersing, for the description indicates that only a part of the mold is actually touched by the liquid, and I think it would hardly be correct to state that where only the inside is touched by the liquid, that the body was immersed.

10 Q. 24. In defendant's process is the mold lowered or dipped into the melted material in the way specified in the Miller & Aylsworth patent as just described by you?

A. It is not. In the defendant's process the mold is actually immersed in the liquid wax, that is, it is placed below the surface of the wax, so that it comes in contact with every part of the mold inside and out, and is there allowed to remain.

20 In the Miller & Aylsworth patent, according to the process as therein described, the outside is so protected that the wax only comes in contact with the inner bore of the mold.

Q. 25. In practicing the Miller & Aylsworth process, what is the importance of lowering the mold gently so as not to produce agitation of the liquid?

A. In this process the wax congeals upon the surface of the bore the instant it touches it. To produce a perfect cast, therefore, it is necessary to introduce it gently, so that this molten wax will flow uniformly and smoothly over the surface of the matrix. That is, the bore of the matrix. If it were introduced while the liquid were in agitation, or dropped violently or rapidly into the wax, this result would not be obtained.

30

Q. 26. In defendant's process is the mold introduced gently so as to avoid agitation of the liquid material?

40 A. It is not, it is dropped quickly below the sur-

face, the material allowed to flow in as it may.

Q. 27. In defendant's process what means are employed for introducing the liquid material into the molds?

A. A tray of molds, usually containing eight, is suspended above a kettle of molten wax, the tray is supported by a chain passing over a pulley to which a counter-weight is attached. The tray of molds, which is placed on the apparatus, is lowered by the workmen quickly below the surface of the wax. It is allowed to remain there for a period of five minutes, which is sufficient to heat the mold to substantially the temperature of the wax. It is then lifted out and set in a cold water bath to be chilled. 10

Q. 28. How does your method of getting the material into the molds differ from filling a bucket in a well, for instance?

A. It does not differ at all, the process is almost identical. 20

Q. 29. Would it be possible with the means you employ in defendant's process, to practice the Miller & Aylsworth process?

A. It would not.

Q. 30. Referring to the Joyce patent, No. 831,668 in suit, I read, beginning line 100, page 1, of the specification, as follows: "The mold, core and base are slightly oiled, and then heated preferably to near the temperature of the melted wax." What do you understand by that? 30

A. I understand that he heats his mold by some outside source, possibly a direct flame, before introducing the wax into the mold.

Q. 31. What do you understand by the words "to near the temperature of the melted wax"?

A. I understand that to mean slightly below the temperature, not quite so hot.

Q. 32. Have you read the specification of this patent, and do you understand the process as described? 40



A. I have read it, and understand the process.

Q. 33. In carrying out the defendant's process, is, or is not, the mold heated to near the temperature of the melted wax before the wax is introduced into it, or heated at all prior to that time?

A. It is not heated at all.

10 Q. 34. Is there in that specification, any means described for getting rid of air bubbles and other things that would produce defective sound-records?

A. There is not.

Q. 35. Would or would not the description contained in this specification be sufficient to enable one skilled in the art to make commercial sound-records without additional information or without further invention?

20 A. There is not sufficient information here, and it would not be possible to make commercial sound-records from this description without further or additional invention.

Adjourned to Monday, January 6, 1908, at 11 o'clock a. m.

NEW YORK, January 6, 1908.

Met pursuant to adjournment.

Present:

30 FRANK L. DYER, Esq., for complainant.

PHILIP MAURO, Esq., for defendant.

By Mr. MAURO:

Q. 36. Referring again to the Joyce patent, do you know whether it was or was not novel at the date of the Joyce application to pre-heat a mold in which wax-like material was molded?

0 A. It was not new, but was a common practice to do this.

Q. 37. Is there, or is there not, any advantage in heating a mold in which sound-records are to be molded to about the temperature of the melted wax as described in the Joyce patent?

A. There is not.

Q. 38. You have stated that it would not be possible with the means employed in your process to practice the Miller & Aylsworth process. Please state whether it would be possible with the means described in the Miller & Aylsworth patent to practice your process? 10

A. It would not be possible.

Q. 39. In your deposition given in the Connecticut suits which has been introduced into this suit, Mr. Frank L. Dyer, who is now present, asked you this question: (x-Q. 32) "In view of the fact that your 1895 mold shows a steam jacket for heating the mold, why did you adopt the clumsy expedient in the 1899 mold of heating the mold by superheated wax"? To which you replied: "A. Merely to obtain the effect of a higher temperature than could be obtained from steam, and also to obtain varying temperatures; and I do not regard the method as clumsy." Please state in what respects, if any, the process now practiced by defendant and involved in this case differs from what Mr. Dyer was pleased to call the "clumsy expedient" used by you in 1899? 20

A. The process used by me in 1899 and referred to in that question is the same as that used by the defendant at the present time, and has been so used by them for the past seven years. 30

Cross-examination by Mr. DYER:

x-Q. 40. Referring to your answer to Q. 14, in which you state that the American Graphophone Co. has never used the process described and claimed in the Miller & Aylsworth patent No. 683,614, do I understand that you appear as a patent expert in this case, or that you are qualified to ex- 40



press the usual opinion that patent experts are called upon to express in patent suits?

A. I am not certain as to the qualifications of a patent expert. My answer, as given there, was based upon my knowledge of the business, my familiarity with the making of molded records. If that exact knowledge constitutes expert knowledge, then it is the same.

10 x-Q. 41. I assume that all you did was to read the Miller & Aylsworth patent, and having found that it described a certain process which differed from the process you used, you concluded from that fact that the American Graphophone Co. had not used any process that was described and claimed in that patent?

A. I have not only read the patent carefully, but I have tried to carry on experiments under this patent as I usually do under every patent that is  
20 issued that seems at all interesting, and from the knowledge I gained from the experiments and the reading of the patent I gave the answer which I did.

x-Q. 42. You have not, as I understand it, ever testified as a patent expert, that is, as a person qualified to explain the meaning of patent specifications and claims for the benefit of the Court?

A. Not to the best of my knowledge and belief.

30 By Mr. DYER: In view of previous answers the answer to Q. 14 is objected to as incompetent.

x-Q. 43. You state that the process now used by the American Graphophone Co. in substantial respects has been continuously carried out since prior to Oct. 1901. It is a fact, is it not, that up to some time in 1903 the process used by the Graphophone Co. involved the employment of steam-heated molds substantially as suggested in your patent No. 682,-  
40 991, referred to in answer to Q. 2?

A. Both processes were used. I am not certain, at this time, when the steam molds were finally discontinued, though the method of making molded records by the process of heating the mold with the wax was used more or less constantly from the very beginning of my work.

x-Q. 44. When you refer to the fact that the molds were heated by the use of hot wax in your early work, you have reference, have you not, to the experimental apparatus that was introduced in the Connecticut suits on the Edison patents, where hot or super-heated wax was poured into a jacket surrounding the mold, in somewhat the same way as the steam was introduced in the molds as used by you at that time? 10

A. I used the 1899 mold in this manner. Experiments were made with this mold, however, of setting it in the hot wax, and of dipping the mold in wax the same as we are doing it now, etc. In fact the only reason for going from the steam molds was to save the material of which the records were made. Of course when the tray is lifted out of the wax it is covered with the record material, and when the tray is set in water this material is lost, and I considered that this would be a substantial item in large work, and it was for that reason I devised the scheme of superheating the mold through the use of steam. This, however, was found after use to be not so good in its ultimate results, and we went back to the original scheme which has been used ever since. 20 30

x-Q. 45. As I understand the history, therefore, of your work, you started out by using a mold having a jacket into which you introduced the super-heated wax, and having found that with such an apparatus there was a substantial loss of the wax used for the purpose of superheating, you adopted the use of steam for superheating purposes, and that 40



later on you adopted the present expedient of employing a plurality of relatively thin molds on a tray and immersing below a large body of wax maintained at a high temperature. Is that correct?

A. Except in the reference to the thin molds. The molds subsequently used were no thinner than those used originally.

10 x-Q. 46. These molds are about  $\frac{1}{8}$  of an inch thick, are they not?

A. Not quite as thick as that, I should judge; I think less than  $\frac{1}{8}$ , not over 3-32, I should think.

x-Q. 47. In your answer to Q. 5 describing the process now carried on by defendant, you state that after the core is removed "the surplus material in the center of the wax mold is removed by a scraper." It is a fact, is it not, that in removing this surplus material the scraper also forms a series of concentric rings on the inside of the record?

20 A. It does.

x-Q. 48. And the subsequent reaming you refer to in the same answer, consists, as I understand it, of scraping off the inside of these concentric rings so as to make the record fit the mandrel?

A. That is right.

x-Q. 49. This expedient of forming the records with concentric rings was adopted in 1903, was it not?

30 By Mr. MAURO: Objected to as immaterial.

A. I cannot recall the date of that adoption. It was somewhere about that time.

x-Q. 50. And before that time, the records made by the American Graphophone Co. had been formed with spiral rings on the inside?

Same objection.

40 A. They were.

x-Q. 51. You state in answer to Q. 7, that the wax-like material used by you is heated from 120° to 150° Fahrenheit above its melting point. Can you tell me what the actual temperature is that you employed?

A. About 400° Fahrenheit. The melting point of this material is rather vague, as it goes from a solid to a semi-plastic condition, gradually approaching a liquid condition through a molasses like consistency. 10

x-Q. 52. I infer from the fact that you used the material at a temperature of about 400°, that its melting point exists somewhere between 250° and 280° Fahrenheit?

A. That has been my assumption.

x-Q. 53. Would it be possible, by your process, to obtain satisfactory duplicate records if the temperature of the material was somewhat lower than that you have mentioned? 20

By Mr. MAURO: Question objected to as indefinite.

A. How much lower?

x-Q. 54. I would like to know generally, if you can tell me, what you regard as the minimum superheating that it is necessary to impart to the wax to produce satisfactory records by the specific process that you use? 30

A. After a considerable number of experiments I established the temperature at 400°, so I consider that the minimum temperature practical to use in this process. As to the question of the possibility of obtaining records at a lower temperature, of course it is possible to do so. I presume that an experimenter would succeed in getting records. Our experiments, however, have convinced us that 400° was about right, and we have maintained that.

x-Q. 55. I understand that you have used sub- 40



stantially the same material at all times, except that since some time in 1903 you have employed certain proportions of Carnauba wax?

A. We have.

x-Q. 56. Did the employment of this Carnauba wax necessitate changing the process at all?

A. It did not.

10 x-Q. 57. You regard the process that you used in 1902 with the steam-heated molds as entirely practical, do you not?

A. It is practical.

x-Q. 58. Do you recall the fact that with that process you used a temperature of only 350°?

A. About that.

x-Q. 59. So that it is possible to obtain commercial results by using the wax as low as 350°, as I understand it?

A. It is possible.

20 x-Q. 60. Your process would be the same, would it not, whether the molds were introduced rapidly or slowly into the wax, except, of course, for the element of time?

A. The result would be the same.

x-Q. 61. Do you find any statement in the Joyce patent in suit that the mold is heated by a direct flame?

A. I do not recollect that.

30 x-Q. 62. In the early part of your examination this morning you refer to the fact that the superheating of molds was not novel at the date of the application for the Joyce patent. Was this true of molds used for making phonograph records?

A. It was true of molds for molding wax cylinders.

x-Q. 63. That is, wax blanks?

A. Yes.

40 x-Q. 64. I presume that you have in mind the experimental work done with the 1895 mold, making

blanks, that was referred to in the Connecticut suits?

A. I have reference to that, and also to processes common in the arts of molding the wax cylinders, such as candles.

x-Q. 65. Mr. Mauro has put on the record a question which was asked you in the Connecticut suits, where, in referring to your 1899 mold in which the superheated wax was poured into a jacket, I referred to it as a "clumsy expedient." Of course, there is a very marked commercial difference, is there not, between such an apparatus and one such as you now use where a series of eight molds are directly immersed in the superheated wax?

10

A. There is a difference, yes.

x-Q. 66. One is a highly commercial process, and the other would be of doubtful commercial utility, would it not?

A. No, I would not consider it of doubtful commercial utility; it can be used very well.

20

DEPOSITION CLOSED.

Signature of witness and certificate of magistrate waived.

30

40



## STIPULATION.

IT IS STIPULATED by and between counsel for the respective parties hereto, subject to correction in case of error and subject to the objections hereafter made, that if PHILIP MAURO were examined as a witness for the defendant, he would testify that he has been chief patent counsel for the said defendant for the past fifteen years and over, and as  
10 such is thoroughly familiar with all its patent litigation; and that from such personal knowledge he makes the following statements:

## I.

Beginning at least as early as during the year 1899, the defendant American Graphophone Company has carried out substantially the same process it is now using in molding cylindrical sound-records, as testified to herein by Thomas H. Macdonald  
20 —beginning at a period earlier than the date of issue of any of the patents upon which these complainants have sued this defendant (or its selling-agent) on account of its said molded sound-records.

## II.

The complainants herein have brought against the defendant herein (or its selling-agent), on account of defendant's said molded sound-records, eight patent suits, as follows:

- 30 1. National Phonograph Co. v. American Graphophone Co., on Edison patent No. 667,662, granted Feb. 5, 1901, (application filed May 8, 1900).

Dec. 27, 1901, bill filed in District of Connecticut.

Feb. 3, 1906, bill finally dismissed.

- 40 2. National Phonograph Co. v. American Graphophone Co., on Edison patent No. 713,209,

granted Nov. 11, 1902, (application filed March 5, 1898).

Jan. 5, 1903, bill filed in District of Connecticut.

Feb. 3, 1906, bill finally dismissed.

3. National Phonograph Co. v. American Graphophone Co., on Miller & Aylsworth patent No. 683,615, granted Oct. 1, 1901, (application filed July 31, 1900) (one of the patents here in suit).

10

Oct. 24, 1903, bill filed in District of Connecticut.

June 24, 1905, bill dismissed by consent.

4. National Phonograph Co. v. American Graphophone Co., on Aylsworth & Miller patent No. 683,676, granted Oct. 1, 1901, (application filed July 31, 1900) (one of the patents here in suit).

Oct. 24, 1903, bill filed in District of Connecticut.

20

June 24, 1905, bill dismissed by consent.

5. National Phonograph Co. v. American Graphophone Co., on Miller & Aylsworth patent No. 683,615 (same as in No. 3).

July 7, 1905, bill filed in Southern District of West Virginia (one of the present suits).

6. National Phonograph Co. v. American Graphophone Co., on Aylsworth & Miller patent No. 683,676 (same as in No. 4).

30

July 7, 1905, bill filed in Southern District of West Virginia (the second of the present suits).

7. New Jersey Patent Co. v. Columbia Phonograph Company, General, on Aylsworth patent No. 782,375, granted Feb. 14, 1905, (application filed Nov. 3, 1903).

April 3, 1905, bill filed in District of New Jersey.

40



June 12, 1908, bill dismissed by consent.

8. New Jersey Patent Co. v. American Graphophone Co., on Joyce patent No. 831,668, granted Sept. 25, 1906, (application filed Oct. 13, 1897).

Dec. 20, 1906, bill filed in Southern District of West Virginia (the third of the present suits).

10 Defendant had been manufacturing its molded sound-records continuously, by the same process it is now using, for several years *before* any of these patents issued.

### III.

The file-wrappers of the Edison patent No. 713,209 (No. 2 above) and of the Joyce patent here in suit (No. 8 above) show the following facts:

20 That on March 8, 1902, the Patent Office Examiner suggested to Thomas A. Edison, in his then pending application, Serial No. 672,650, filed March 5, 1898, (which eventuated in the Edison patent No. 713,209—No. 2 above) certain claims then found in the said Joyce application, Serial No. 655,027, filed Oct. 13, 1897 (which eventuated in the said Joyce patent No. 831,668, here in suit—No. 8 above); of which the second suggested claim, found on printed page 595 of the Transcript on Appeal in the said Connecticut suit No. 2, is identical word for word with the then Joyce Claim 5,—  
30 other claims suggested to Edison in the same office letter being for the same substantive invention, but differing in phraseology. The said Joyce Claim 5, found on page 440 of the said Transcript and thus suggested to Edison, is as follows:

40 "5. The method of producing hollow cylindrical phonograms which consists in obtaining a mold having a reverse phonogram record on the inner wall of a cylindrical opening, form-

ing a hollow cylindrical plastic phonogram within said mold, releasing the phonogram from the mold by a difference of temperature between the mold and phonogram sufficient to entirely clear the surfaces, and removing the phonogram from the mold by direct longitudinal movement."

That on March 10, 1902, (as appears on page 596 of said Transcript) Edison, by amendment, incorporated into his said application (No. 672,650) the Claims thus suggested to him from the Joyce application, the Edison Claim 2 then presented being identical with Joyce's Claim 5 above quoted.

That thereafter, by subsequent amendment to his said application, on April 24, 1902, (as appears on page 599 *et seq.* of the said Transcript), Edison presented a *substitute* Specification and Claims,—his above-named Claim 2 (identical with Joyce's said Claim 5) being re-framed as Claim 3, and a new Claim 2 being inserted for the same subject-matter; and (on page 611 of said printed Transcript) in regard to said amendment Mr. Edison's attorneys said:

"NOTE: The claims above presented are the same as those which have been erased, except that a new second claim has been added, expressing the radial contraction of the duplicate from the matrix in somewhat broader terms than the former second (present third) claim; the latter claim has been also changed in language so as to more clearly express the invention. \* \* \*"

That thereafter, on June 24, 1902, an Interference No. 21,893, was declared between the said Joyce pending application (that eventuated into the Joyce patent here in suit—No. 8 above) and



the said Edison pending application (that eventuated into the Edison patent No. 713,209,—No. 2 above). The issue of the Interference was whether Joyce or Edison was the true and first inventor of the subject-matter, which as formulated included two "Counts," corresponding to Edison's Claims 2 and 3 aforesaid, and the then Joyce Claims 9 and 5 respectively.

10

That thereafter, on or about

20

the said Joyce filed, in favor of the said Edison, his concession of priority as to the said issue thus involved in the Interference; that on or about Oct. , 1902, the said Joyce, by an instrument in writing duly executed and delivered, assigned his said invention and application to the National Phonograph Co. (one of the complainants herein); that on Oct. 10, 1902, the said instrument of assignment was forwarded, by Messrs. Dyer, Edmonds & Dyer (Edison's attorneys), to the Patent Office for recording; and the said instrument was duly recorded in the United States Patent Office on Oct. 11, 1902. That judgment of priority in favor of the said Edison and against the said Joyce application having been rendered by the Patent Office, thereupon, on Oct. 16, 1902, the aforesaid Claims 5 and 9 of the said Joyce application S. N. 655,027, were finally rejected; and on Oct. 27, 1902,

30

said Claims 5 and 9 of the said Joyce application were canceled. That on Jan. 21, 1903, all the rest of the Claims of the said Joyce application were rejected on the Edison patent No. 713,209, which had issued as the result of the said Edison application aforesaid; that in March, 1903, Frank L. Dyer, Esq., (Mr. Edison's attorney, and counsel for the complainants herein) was appointed associate attorney for the further prosecution of the said Joyce application; in the meantime, and beginning on

40

April 30, 1902, the said National Phonograph Co.

had taken its *prima facie* proofs in suit No. 1 above, closing the same on May 7, 1902, and the defendant had taken as its answering proofs, beginning Oct. 21, 1902, the testimony of Miller, Aylsworth, Cameron, Norton, Macdonald, Stevenson, Brynes and Osborne.

That on Dec. 22, 1905, and after all of defendant's proofs in both of the Connecticut suits aforesaid (Nos. 1 and 2) had been taken and closed, Mr. Dyer (as Joyce's attorney) canceled all the Claims then remaining in the Joyce application, and presented the Claims now appearing in the Joyce patent in suit; that on Jan. 6, 1906, Claims 3, 4, 5 and 6 (being the same Claims 3, 4, 5 and 6 now appearing in the Joyce patent) were rejected by the Patent Office on the said Edison patent No. 713,209 (particularly Claims 2 and 3 thereof); and that, in response to this rejection, Mr. Dyer (as Joyce's attorney) presented the arguments referred to by defendant's witness Massie in answer to Q. 9.

That the said Edison application S. N. 672,650, containing the Claims thus taken from the Joyce application, was issued as patent No. 713,209, dated Nov. 11, 1902; that the National Phonograph Company sued this defendant on the last-named Edison patent, being suit No. 2 above; and that the Claims involved were the aforesaid Claims 2 and 3 thereof that had been thus taken out of the said Joyce application.

#### IV.

That the suit No. 2 above referred to, brought against this defendant in the District of Connecticut on the Edison patent No. 713,209, aforesaid (together with suit No. 1 on Edison patent No. 667,662), came on to be heard before his Honor Judge PLATT in June, 1904; and that on or about March 17, 1905, a written opinion was filed, the



same being reported in 135 F. R. 809; and that pursuant to said opinion Final Decrees were entered on March 30, 1905, dismissing the two bills of complaint with costs to defendant.

10 That thereafter the said National Phonograph Company perfected its appeals from said final decrees, but on or about Dec. 6, 1905, voluntarily dismissed its said appeals; and in the meantime, on or about June 24, 1905, the said suits Nos. 3 and 4, on the Miller & Aylsworth and Aylsworth & Miller patents respectively (here in suit), then pending against the said American Graphophone Company in the District of Connecticut, were likewise voluntarily dismissed by the said National Phonograph Company.

20 The paragraph numbered I. is objected to for the reason that it is a mere conclusion and is incompetent, irrelevant and immaterial.

In the paragraph numbered II., subheades 1, 2, 3, 4 and 7 and the last 3 lines of said paragraph (following subhead 8) are objected to as irrelevant and immaterial.

The paragraphs numbered 3 and 4 are each objected to as irrelevant and immaterial as matter of argument and as not the best evidence.

30

FRANK L. DYER,  
Counsel for Complainants.

C. A. L. MASSIE,  
Counsel for Defendant.

40

NEW YORK, January 8, 1908.

## DEPOSITION OF C. A. L. MASSIE.

Deposition taken by consent of counsel in the absence of counsel for complainant subject to objection and cross-examination by him.

C. A. L. MASSIE, being duly sworn, deposes and says as follows:

10

I am forty years of age. I reside in Hackensack, New Jersey, and have an office in the City of New York. I am an Attorney and Counsellor at Law, making a specialty of patents and patent causes, and I am a registered patent solicitor and a member of the firm of Mauro, Cameron, Lewis & Massie, of Washington, D. C., and New York, N. Y.

Q. 1. Please state what experience you have had that qualifies you to testify regarding the three suits above-entitled?

20

A. After academic and collegiate education, and some years experience as a school teacher, early in 1904 I became an Assistant Examiner in the United States Patent Office. For nearly four years it was my daily duty in the Patent Office to examine applications for patent, involving the study of earlier patents and publications, the consideration of the Specifications, Drawings and Claims of the Patent Office applications and of earlier patents. In January, 1898, I became associated with Philip Mauro, Esq., senior counsel for complainant herein, and was placed in charge of our New York office. During the past ten years I have paid more attention to the talking-machine art and the patents relating thereto than to any other art. I have prepared and prosecuted a great many applications for patent in various arts, but particularly in the talking-machine art. I have also acted as of counsel for the American Graphophone Company in nearly all the

30

40



patent suits in which it has been involved during the past ten years.

I believe myself familiar in a general way with the patents that have been granted in this art, and also in a general way I consider myself familiar with the practical developments of this business during the past ten years. I believe I am acquainted with most of the technical terms employed in this art.

Q. 2. Have you read the Joyce patent No. 831,668 and the Miller & Aylsworth Process patent No. 683,615, sued on in two of the above-entitled suits; and, if so, do you understand the same?

A. I have read the two patents named and I believe I understand them.

Q. 3. Have you read complainants' *prima facie* proofs in each of the three suits, above-entitled, including the stipulations of defendant's counsel therein; and, if so, do you understand the process therein set forth as the one practiced by defendant in making molded cylinder records?

A. I have read the same, and I believe I understand the process therein set forth as defendant's process.

Q. 4. Please state briefly the gist of what you understand is set forth by Claims 3, 4 and 6 of the said Joyce patent and by Claims 3, 4 and 5 of the said Miller & Aylsworth Process patent, and compare the same broadly with the process practiced by defendant?

A. Broadly stated, the process of each of the two patents inquired of is the casting of a suitable material into a suitable mold to produce an article of a certain shape and having certain inherent qualities. The shape of the article depends upon the shape of the mold. The inherent qualities of the article depend upon the inherent qualities of the material employed for making the casting.

And, also, broadly stated, the process in each case consists in introducing the material in a molten state into the mold. All this is true of every casting process, whether the object of the process is to make sound-records or to make candles, or to make any other casting,—namely, a suitable mold is provided and the material (in a molten condition) is introduced into the mold. Up to this point the foregoing remarks are also true of what is set forth in the *prima facie* proofs as “defendant’s process.” But there is nothing so far stated by me that relates particularly to the talking-machine art. There is nothing so far stated that is peculiar to the making of sound-records. Indeed, the process above set forth is not a *phonographic* or *sound-record* process; it is merely a *casting* process or *molding* process. 10

The same process, as thus broadly stated, namely, the introduction of molten material into a suitable mold, has been employed for many years—I believe since the early 90’s at least—in making blank cylinders for use upon talking-machines. That is, a cylindrical mold having a *smooth bore* is employed; and a suitable composition is melted and introduced into the mold. After the material has cooled and set, the casting is removed, just as any other casting would be, and it will then have a smooth cylindrical surface corresponding to the smooth cylindrical bore in which it was cast. 20 30

In defendant’s process, in the process of the Joyce patent, and in the process of the Miller & Aylsworth patent, a cylindrical mold is employed, but its bore (instead of being perfectly smooth) has minute irregularities, being the reverse of the record-groove of an original sound-record. When the molten material has been cast into such a mold, and after becoming set has been removed therefrom,—the cyl- 40



indrical casting obtained will present (instead of a uniform surface) one having a helical record-groove—the reverse of the surface of its mold—just as any other casting would present the reverse of the surface upon which it has been cast.

10 Still speaking broadly, the gist of Claims 3, 4 and 6 of the Joyce patent consists in introducing the molten material into a *hot* mold, the mold being heated “preferably to near the temperature of melted wax” (line 103 of page 1 of Joyce patent).

Claims 3, 4 and 5 of the Miller & Aylsworth patent require that the molten material *must* be introduced into a *cold* mold, provision being carefully made to *keep the mold from becoming heated*.

20 These two “processes,” then, are diametrically the opposite each other. Joyce requires a *hot* mold, while Miller & Aylsworth require a *cold* mold; and it is inconceivable to me how any one could in the same procedure be carrying out simultaneously these two patented processes. As a matter of fact, defendant’s process introduces the molten material into a *cold* mold (instead of into a hot mold as required by Joyce); and defendant’s process consists emphatically in subsequently raising the temperature of the mold until it becomes heated far above the temperature of melted wax, and in *maintaining*  
30 this high temperature for a considerable length of time, instead of introducing the wax into the cold mold of Miller & Aylsworth and preventing the mold from becoming heated.

In short, considering the process of the Joyce patent and of the Miller & Aylsworth patent in the broadest possible light, it is evident that defendant’s process is entirely different from each of the two patented processes.

40 Q. 5. What do you find to be the alleged novelty in the process set out in Claims 3, 4 and 6 of the

Joyce patent, being the Claims here in suit?

A. On reading this Joyce patent it would appear that the patentee when he presented his application to the Patent Office had no idea of the difficulties to be encountered in the production of cast or molded sound-records; and I think it quite probable that he was not at all familiar with the material or composition employed in making sound-records, either cast or original. Certainly his specification gives no intimation as to any difficulty or difficulties to be encountered in making cast cylinder records, or as to any precautions to be taken in avoiding or overcoming these difficulties. Joyce's Specification directs us to take a mold and do two things to it before we introduce the molten material; and he recommends that a third step be performed after the material has been introduced. He tells us first to oil the mold slightly; and then, second, to heat the mold. What effect the heating of the mold will have upon the oil, or what effect the heated oil will have upon the cast sound-record, is problematical.

I will observe here that this step of oiling the mold beforehand was especially emphasized in the prosecution of the Joyce application in the Patent Office, by reason of the fact that the reference to the oil was inserted by interlineation after the Specification was written out. This indicates that the matter was brought particularly to the attention of the applicant and his attorney, and the insertion deliberately made.

His Specification says that the mold and its adjacent parts are slightly oiled "and then heated, preferably, to near the temperature of melted wax." (Bottom of second column.) No reason or explanation is assigned for this,—unless it be found in the statements that follow immediately after, "This heating expands mold H slightly," etc.



10 Considering not only what is stated in the patent, but also what is *not* stated in the patent, the only reason that can be attributed to the patentee, in directing us to heat the mold, following this by the statement that heating expands the mold slightly, is that Mr. Joyce must have supposed that if his mold be slightly expanded beyond its normal dimensions *before* the material is introduced, then, upon calling, the mold will contract, and apply uniform pressure, squeezing or compressing the contents forcibly so as to make a perfect casting. Such idea upon Mr. Joyce's part would seem plausible enough to one who was not practically familiar with the art, and is a consistent explanation of why he directs the heating of his mold.

20 I said that I came to this conclusion not only from what is stated in the patent but from what the patent *omits* to state. By the last clause, I refer to the fact that the patent gives no directions for heating the material to a temperature substantially *above* its melting-point, and there are no suggestions that this high temperature must be *maintained* for a considerable time. The patent does not even intimate that these two steps (superheating and maintaining the superheat) would be desirable; and no provisions are recommended that would produce either of these results. On the contrary, the teaching of the patent is that the wax must *not* be superheated.. I understand that in the development of the molded sound-record in a practical manner, the presence of air bubbles, entrapped between the matrix-surface and the molten material, caused a great deal of difficulty; and that this obstacle has been removed by defendant, by superheating the wax and maintaining the high temperature, by which the air bubbles are driven off. I understand that complainant, in its practice of the art of molding sound-records, uses molds that are

30

40

open at the bottom, and introduces the material in a gentle, quiet manner from the bottom upward, so as thus to avoid air bubbles. Since Joyce says nothing about any air bubbles or any similar defect, and since he does not tell us to introduce the material from the bottom, or to superheat the material and maintain the high temperature; and since he *does* say that this heating "expands mold H slightly,"—the only rational and consistent explanation is that Mr. Joyce intended to expand his mold first so that upon cooling it would contract and squeeze its contents. Otherwise, why should he feel called on to mention the perfectly obvious fact that heating a metal mold *expands it slightly*?

From what has been said, it follows that the Joyce patent directs us to heat the mold *before* the molten material is introduced. And this is borne out by the fact that the sentence immediately following begins with the conjunction "then," which is a temporal conjunction, thus:

"The mold etc. are slightly oiled and *then* (as a second step) heated \* \* \* *Then* (as a third step) melted wax is poured \* \* \* *After* the wax has been poured \* \* \* it will generally have the exact form of the mold *when cool*."

"Then," *after* the mold has been heated, the melted wax is poured into it, and "after this wax has been poured it will generally have the exact form of"—what? Why, "of the mold when cool." This, to my mind, reinforces the proposition that Joyce's idea is: "I must first expand my mold by heating it; so that I can then, subsequently, pour in my wax; and then permit or cause the mold to contract (by cooling it) so as to give my casting the exact form of the mold *when cool*."

When I came to consider the Claims here in suit,



namely, Claims 3, 4 and 6, I find the first step recited in each is said to consist of casting the molten material into "a *hot* \* \* \* record-mold." I agree with complainant's expert, Mr. Holden, where he says (x-Q. 6) that this step of "casting" begins with the introduction of the first of the molten material into the mold, and ends as soon as the last portion of the molten material has been introduced.

10 I also agree with Mr. Holden where he says (x-Q. 9) that the kind of mold which these Claims of the Joyce patent direct us to fill with the molten material is a *hot* mold, and with his statement in the second paragraph of his answer to Q. 4, that in the Joyce process the mold is pre-heated.

To sum up: what I find set forth in the Claims 3, 4 and 6 of the Joyce patent as purporting to be novel consists of *pre-heating* the mold before the

20 molten material is introduced into it. This I understand to be the gist of the alleged invention set forth by these three Claims.

If we ignore the explicit statements of these Claims and of the Specification already referred to, and if we read into the Joyce patent the information contained in other patents that were applied for by other investigators, and disclosed to the world by other patents subsequent to Joyce's filing date, then it might possibly be contended that the

30 gist of the three Joyce claims in suit consists of using a *hot* mold, whether the same was heated before or after filling it with the wax. But there is no justification for this view. There is nothing in the Claims themselves to warrant it.

Q. 6. What have you to say as to the novelty of employing a hot mold in casting cylinder records or other cylindrical objects composed of a wax-like material? And as to subsequent chilling?

40 A. I produce a book entitled "The Scientific

I find the first step re-  
 corded of casting the molten  
 " \* \* record-mold." I agree  
 with Mr. Holden, where he  
 says of "casting" begins  
 the first of the molten ma-  
 terial as soon as the last  
 material has been introduced.  
 Holden where he says (x-Q.  
 "which these Claims of the  
 with the molten mate-  
 rial the statement in the sec-  
 tion to Q. 4, that in the  
 is precluded.

set forth in the Claims 3,  
 as purporting to be  
 the mold before the  
 forced into it. This I un-  
 derstand the alleged invention set  
 out.

These statements of these  
 already referred to,  
 have patent the informa-  
 tion that were applied  
 to, and disclosed to the  
 subsequent to Joyce's filing  
 it be contended that the  
 claim in suit consists of  
 the same was heated  
 with the wax. But there  
 is nothing  
 to warrant it.

As to the novelty of  
 casting cylinder records  
 composed of a wax-like  
 material chilling?  
 entitled "The Scientific

American Cyclopaedia of Receipts, Notes and Quer-  
 ies. Edited by Albert A. Hopkins. New York:  
 Munn & Co., Publishers, 1893." On page 63, title  
 "Candles," I find under the heading "Cerophane  
 Candles" the following:

"Melt over a water bath 50 parts of stearic  
 acid and 5 to 5½ parts of bleached beeswax  
 \* \* \* Pour the mass into molds, *which*  
*have been heated to the same temperature*, but  
 avoid stirring." (Italics mine.)

10

Another book, entitled "Chemical Technology or  
 Chemistry in Its Applications to Arts and Manu-  
 factures." Edited by Groves & Thorp,—the same  
 purporting to be "Vol. II. Lighting," etc., and pur-  
 porting to be published in Philadelphia in 1895 by  
 P. Blackiston, Son & Co., contains on page 79 ref-  
 erence to Binn's Machine for making candles. This  
 Machine is attributed to the year 1801, and the  
 leading idea of it is said to be "the alternate appli-  
 cation of heat and cold (in the form of steam and  
 water respectively) to the molds \* \* \*" Groves  
 & Thorp contains on the same page 79, as "Figure  
 38," a cut of this Machine. The article goes on to  
 speak of the alternate proceedings:

20

"according as to whether the molds were to  
 be *heated* for the reception of the material or  
 cooled *after* being charged with it." (Italics  
 mine.)

30

The same Groves and Thorp publication, on pages  
 80 and 81, refers to "Palmer's First Machine" and  
 "Tucks Machines." The latter is illustrated in Fig-  
 ures 40 and 41 (on page 82 of the Volume) "in  
 which he employed steam and cold water for vary-  
 ing the temperature of the molds."

A third volume is entitled "Soaps and Candles.  
 Edited by James Cameron," etc. It purports to be

40



the second edition, published in London by J. A. Churchill in 1896. On pages 266-267-268 of this volume, I find descriptions of molding stearine, sperm, paraffin, and composite candles, respectively. The paragraphs referred to note that as a general rule the mold should be heated to about the temperature of the solidifying point of the material used; that with some compositions the mold should be slightly hotter than this temperature, and with others slightly below this temperature.

I likewise produce British patent No. 454 of 1856 to Field & Humfrey for "Improvements in the manufacture of Paraffine Candles." On page 3 of this patent I find the following:

#### "DESCRIPTION OF THE PROCESS.

"We take paraffine and melt it, and at a temperature of about 140° Fahrenheit run it into candle molds heated to the same temperature, or rather higher. The pipes thus filled are allowed to stand a few minutes, to permit the air bubbles to escape and rise to the surface, and are then plunged into cold water. This sudden cooling of the paraffine prevents its forming itself into crystals, and we thus obtain candles nearly transparent, and which will draw freely from the pipes.

"For paraffines of good quality a wick of ordinary plaited cotton can be used, and by dipping the cotton wick into a weak solution of boracic acid (say four or eight grains of boracic acid to an ounce of distilled water), the ash of the cotton wick will be fluxed, and the candles burn with a bright and clear end. We are aware that the process of filling the molds hot and dipping them suddenly into cold water has been applied to the manufacture of other description of candles, such as candles made of pressed lard; we therefore claim only the application of the process herein-before described

to the manufacture of candles made entirely or partly of paraffine."

I likewise produce U. S. patent No. 86,059, granted Jan. 19, 1869, to Cowles, for an Improved Machine for Making Candles. This patentee directs the heating of the mold before the molten material is introduced and the subsequent chilling of the molds by cold water. Near the bottom of the second column of page 2 I find: 10

"Steam or hot water is then let into the trough *b*, through the perforations along the sides of the pipe *e*, and *when the molds are sufficiently warmed*, the melted stuff is poured into the receptacle *c3*, from whence it runs into and fills the molds. Cold water is then introduced, by the pipe *d*, \* \* \*" (Italics mine.)

And in the next column of the Cowles patent I find this statement of the general knowledge in 1869: 20

"I am aware that it is not new to enclose the molding-pipes or tubes within a tight chamber upon a frame, so that, at pleasure, water can be admitted to chill the tubes, or steam to heat them, \* \* \*"

U. S. patent No. 182,547, granted Sept. 26, 1876, to Bingham, for Improvement in Apparatus for Casting Composition Rollers for Printers, in the first column of page 2, refers to the desirability of heating the cylindrical molds by steam, "before the pouring operation;" and in the next paragraph directs the introduction of a current of cold water so as to chill the contents of the molds. 30

U. S. patent No. 419,914, granted Jan. 21, 1890, to Bingham, for Apparatus for Making Printers' Rollers, illustrates and describes an apparatus in 40



which steam is admitted around the cylindrical mold for heating it before the molten composition is introduced, and for introducing water after the material has been introduced in order to cool and set the composition.

10 U. S. patent No. 545,356, granted Aug. 27, 1895, to Fournier, for Apparatus for Molding Candles, shows and describes a plurality of cylindrical molds having means for admitting hot and cold water around the exterior of the molds. In lines 78-87 of page 1 thereof I find the following:

20 "The molds 16 are arranged in groups in boxes or tanks 17, the said boxes being arranged to alternately receive hot and cold water, the hot water surrounding the molds before the *operation of molding*, after which the hot water is discharged and cold water is admitted to surround the molds to hasten the cooling and setting of the candles \* \* \*

(Italics mine.)

From the foregoing references it will be seen that it was a common expedient in molding cylindrical articles of wax or wax-like composition to *heat* the mold (either before or after introducing the molten material) and subsequently to apply cold water in order to hasten the chilling.

30 I have also pointed out that, broadly stated, the process set forth in the Joyce patent is a casting process and not a phonographic process. I mean by this, that to constitute a process "a phonographic process," the process should be directed to overcoming certain difficulties peculiar to the phonographic art. But since the Joyce Specification does not do this, his process cannot be regarded as a process peculiar to the phonographic art. Therefore, in my opinion, at the date of the application for the Joyce patent in suit, in the casting of cylindrical sound-  
40 records, there was nothing novel whatever in the

mere idea of employing a hot mold (whether that mold be heated before or subsequent to filling); and there was likewise nothing novel in subsequently applying cold water in order to hasten the chilling.

Q. 7. Do you find among the prior patents classified in the talking-machine art any disclosures of the use of a hot cylindrical mold for producing duplicate cylindrical sound-records?

A. In answering the last question I might have included a number of other patents which have been brought to my attention, among others, U. S. patent No. 303,970, granted Aug. 26, 1884, to Appelt, for Apparatus for Coating Drawing-Rollers. This is another illustration of the use of a cylindrical mold for casting, by melting the material and pouring it into the mold. The mold is brought to a high temperature by a hot water bath, which Appelt points out "will prevent this compound from becoming chilled while rising gradually in the tube;" and subsequently the mold with its molten contents is allowed to remain a short time in the hot water, after which they are placed into a cold water bath, which shrinks the casting and permits it to be easily drawn out of the cylindrical tube.

Now, answering Q. 7, I call attention to the U. S. patent No. 528,273, granted Oct. 30, 1894, to Lioret, and to British patent No. 1,478 of 1894, to Young. Lioret is dealing with cylindrical sound-records, and among other things names in the second column of page 2 what he calls a "galvano-plastic mold,"—this is, a cylindrical mold formed by electro-deposition upon the original cylindrical sound-record, the mold having within its bore the reverse of the irregularities on the surface of the original sound-record. He employs this mold for producing duplicate sound-records of *celluloid*, by the combined use of heat and pressure. He uses a *hot* mold,



against the surface of which the celluloid is forced by pressure. I am aware of the fact that this Lioret process is not a "casting process," since he was not dealing with *melted* material that could be poured into the mold, as in case of Joyce. But, as soon as one undertook to use a waxlike fusible composition in place of celluloid, he could avail himself of the expedients already well-known in casting with  
10 fusible wax-like materials, including the preheating of the mold and the subsequent application of cold water. And this subsequent application of cold water is expressly set out in the same passage in the Lioret patent.

The Young British patent discloses the use of an ordinary cylindrical mold, such as hitherto described, formed by electro-deposition upon the ordinary cylindrical sound-record. Young uses his mold in the same way as above set forth for Lioret;  
20 that is, he preheats it, places within it a very thin shell of celluloid which is softened by the heat already imparted to the mold, and applies pressure. It is true that Young, using a very thin shell of celluloid, withdraws his duplicate sound-record from the cylindrical mold by "collapsing" it. But, as I suggested in connection with the Lioret patent, as soon as one undertook to employ a wax-like fusible composition in place of the thin shell of celluloid,  
30 he could avail himself of the expedients already pointed out as well known in casting with such fusible materials, including the pre-heating of the mold and the subsequent application of cold water (both directed by Young); and, from the very nature of the material used, upon cooling it would shrink away from the mold sufficiently to be withdrawn without collapsing it. In support of this last statement I quote from Judge Platt's decision upon an Edison patent, when speaking of the fact  
40 that Young was using a thin strip of celluloid,—as follows:

"By using a material then well-known in the art, with a higher co-efficient of expansion and contraction, it would seem that the necessity for collapsing would have been obviated."

*National Phonograph Co. vs. American Graphophone Co.*, 135 Fed. Rep., 811.

Q. 8. Please consider specifically Joyce's claims here in suit, and state what you find novel therein?

A. Claim 3 of the Joyce patent assumes the presence of what is called "a hot, seamless, tubular record-mold,"—which is in brief an ordinary cylindrical mold having within its bore the reverse of the record-groove of an ordinary sound-record. The Claim further assumes the presence and availability of the molten material, which is spoken of as "fused wax-like material at substantially the same temperature as the mold." The *temperature of the mold* is preferably only about the melting-point of the wax (see lines 102-3 of p. 1). The presence of these two articles (the *hot* mold, and the molten material) forms no part of the "process." These two articles may be regarded as the tools or implements with which the process is to be carried out.

Having these two implements available, the Claim recites three steps as constituting the process:

- (1) Pouring the molten material into the mold;
- (2) Cooling the mold and contents \* \* \* ;  
and
- (3) Removing the hardened casting longitudinally from the mold.

There is absolutely no step directed by this Claim that is not taken in every casting operation. It should be noticed that the Claim does not direct us to *heat* the mold,—the heating of the mold *forms no*



part of the process set forth by the Claim. But, if we assume that the heating of the mold is implied in the Claim because the Claim directs us to pour the material into a *hot* mold, then, in the first place, defendant *introduces* its molten material into a *cold* mold. And, in the second place, the heating of the mold is a well-known expedient in casting cylindrical objects.

10 So far as removing the hardened casting "longitudinally" from the mold, this is the natural and obvious manner of getting any cylindrical casting out of its mold. I refer to Judge PLATT's Opinion already referred to, rendered in *National Phonograph Company vs. American Graphophone Company*, reported in 135 Fed. Rep., p. 809, on p. 810. His Honor was referring to certain Edison patents for molding cylindrical sound-records, and ob-

20 serves:  
"In using molds, when the article to be produced was spherical, it is evident that the mold must be divided; but when the article is not spherical, and if the molten material is of such a character that upon cooling it contracts, then a continuous mold can be used. It will be conceded, I think, that casting wax-like materials in continuous molds to obtain blanks, which, after shrinking, could be withdrawn *lengthwise*, was not a very difficult matter, and was thoroughly developed long before either patent  
30 in suit." (Italics mine.)

To sum up with regard to Claim 3, the first step of pouring or casting, the molten material within a *hot* mold was a common expedient. The next step, cooling the mold and its contents, is and was the common expedient resorted to as the second step in the casting art. And the final step, of removing the casting lengthwise from the cylindrical mold, is obviously a common method of getting such casting  
40 out of its mold. In whatever light we view the

Claim," I can find nothing novel in it.

Claim 4 is the same in substance as Claim 3, differing therefrom solely in reciting that he first allows the material to set and then cools it. As the method of cooling described by the patent consists in the application of cold water, I take this passage to mean that the Claim directs us not to plunge the mold and its molten contents into water as soon as the mold has been filled, but to allow the *liquid* contents to cool in the air until the wax has become solid, and thereafter to apply the cold water treatment. With regard to this Claim, in my opinion, it does not differ in substance from the process disclosed in Claim 3, and contains no novel step. In the second place, if we emphasize the fact that the Claim directs us to delay the application of the cold water until after the wax has become solid, clearly defendant does not practice this process, because defendant plunges its mold containing the molten wax *immediately* into the cold water bath, while the wax is still not only molten but at an abnormally high temperature, far *above* its melting point.

Claim 6 is in substance identical with Claim 3. It presupposes the presence and availability of the same two implements, namely: (1) the hot mold; and (2) the melted wax,—which, of course form no part of the process, but are merely the implements with which the process is to be carried out. Claim 6 recites the same three steps recited by Claim 3, namely: first, pour the melted wax into the hot mold; second, cool the contents,—specifically by placing the mold in a water bath; and, third, take the hardened casting lengthwise out of the mold. This Claim also is utterly wanting in novelty. Each step called for is old, and the succession of steps is old. In casting any cylindrical object we must have the material in a molten condition, and the references cited in a previous answer show that



it was old to have the mold also in a heated condition. We would then, in any casting process, pour the melted material into the mold; we would then cool the mold and its contents; and we would finally withdraw the casting from the mold, and if the shape be cylindrical we would withdraw it in a direct longitudinal manner, what Judge PLATT calls "lengthwise."

- 10 Q. 9. You have said that in your opinion the alleged novelty of the Claims of the Joyce patent here sued on consists in heating the mold *before* the melted wax is poured in,—that is, in *pre-heating* the mold. Do you find any statements in the file-wrapper and contents of the Joyce application which eventuated in the Joyce patent No. 831,668 in suit, that bears out your conclusions?

- 20 A. I certainly do. The file-wrapper is very voluminous. The application was filed Oct. 13, 1897; and was not allowed until July 6, 1906, nearly nine years, and the patent did not issue until some months after that. Without searching through this entire mass, I note that Claims 3, 4, 5 and 6 having been rejected by the Patent Office on Jan. 6, 1906, in view of certain patents of Edison, Mr. Frank L. Dyer, the attorney for the applicant, on March 10, 1906, presented an argument, saying, among other things:

- 30 "Each of these Claims specifies \* \* \* the use of a *hot* mold. This feature of the process \* \* \* prevents the wax from *instantly congealing* upon coming in contact with the surface of the mold \* \* \* " (Last italics mine).

In reply to this, on April 10, 1906, the Patent Office cited the English patent of Young, saying this patent

- 40 "discloses a *previously* heated mold \* \* \* "

In reply to this rejection of the Claims here in suit, on June 14, 1906, Mr. Dyer made an argument in the course of which he said:

"There is much more likelihood of entrapping air in a casting operation, and in order to prevent this the mold is heated to the melting-point of the wax *before the molten wax is introduced* \* \* \* " (Italics mine).

10

As the result of these arguments—viz: that the invention is limited to *pre-heating* the mold in a casting process—the Claims, which had been rejected upon prior patents, were allowed. It appears, therefore, that the consideration for allowing the Claims here sued on was that the applicant and the Patent Office limited the Claims not only to the casting process, but also to *the pre-heating* of the mold (*before* the wax is poured in).

20

Q. 10. What do you understand is the process set forth in Claims 3, 4 and 5 of the Miller & Aylsworth process patent No. 683,615, here in suit?

A. This patent purports to be for a method of duplicating phonographic records, and it presupposes a suitable matrix or mold, and a tank or other vessel containing suitable wax-like record-material in a molten condition. Of course, the mold, the tank, and the melted wax form no part of the process. The process of this patent can scarcely be better described than in the language of the companion Aylsworth & Miller Apparatus patent No. 683,676, also sued on, as follows: The process (italics mine)

30

"consists in immersing in a bath of molten wax-like coagulable material a matrix or mold which carries on its bore the representation in negative or relief of the record to be duplicated,"—

40



that is to say, the mold is plunged beneath the surface of the molten wax; yet this mold is not immersed haphazard, it must be immersed *in a particular manner*—

“whereby the molten material will fill the bore of the matrix or mold, *but will be excluded from its exterior*”—

- 10 which last is an important feature of the invention. And this is not all, the process must be carried out in such a manner as that

“the reduced temperature of the matrix or mold relative to the molten material”

will cause

“the latter to coagulate or chill *upon the bore* of the matrix until a layer of the desired thickness has been secured,”—

- 20 and right here comes in another essential feature of the process, namely: that after this layer has been secured the mold must no longer be permitted to remain immersed in the bath,—

“after which the material or mold is removed from the bath of molten material and the bore of the duplicate finished by a reaming-tool, the resulting duplicate being finally removed from the matrix or mold by shrinking.”

- 30 The chief principle underlying this Miller & Aylsworth process is that a *cold* metallic surface brought into contact with *melted* wax will chill the wax; and if the melted wax be at a temperature only about twenty to forty degrees above its melting-point (see lines 22-3 of page 2 of the patent), then the cold metal surface will chill the wax sufficiently to solidify it. Yet *this* is not all: two precautions must be taken in order not to defeat the purpose of the process. The mold must not be permitted to  
40 remain in contact with a mass or large quantity

of the molten wax, lest the metal itself should be heated to the temperature of the melted wax, which would result in re-melting the coagulated deposit already produced; and, besides, the mass of hot liquid wax must be kept out of contact with the outer side of the metal mold, lest the metal be heated and thereby in turn re-melt the coagulated deposit. The patentees provide a casing or shell that surrounds the mold to keep the hot wax from contact with it, and a collar or cap at the top to prevent the material from overflowing the top of the mold (line 16<sup>1</sup> of page 2 of the patent).

In short, the purpose of the first portion of the process is to secure upon the bore of the mold a coagulated deposit of the wax; and this deposit can be secured only by (1) employing a *cold* mold; (2) protecting the exterior of the mold from contact with the hot wax—i. e., keeping the mold cool; and (3) removing the mold (with its coagulated—solid—deposit) from the vat before the mold becomes heated to the temperature of the molten wax. In addition to these three essentials, I understand that in producing molded sound-records by this Miller & Aylsworth process there is still another indispensable condition, namely: (4) the melted wax must be introduced from the *bottom* of the mold, and it must be introduced in a gentle, quiet manner so as not to stir up the liquid and cause air bubbles, or produce an uneven deposit (striations); and (5) the temperature of the wax must not be much above its melting point.

Turning now to Claim 3, I observe, that this Claim calls for two implements for carrying out the process, first, the mold; and, second, the mass of melted wax (in a tank or vat). The steps called for by the Claim are three, viz:

*First*, immersing the mold in the molded wax, in a particular manner;



*Second*, finishing the bore of the "duplicate" so secured; and

*Third*, separating the duplicate from the mold.

10 The particular manner in which the mold is to be immersed, as already indicated, consists of *first* lowering it gently and gradually so that the melted wax will rise within the mold *from the bottom*, in a quiet, placid manner; *second*, in simultaneously protecting the outside of the mold from being heated by the wax, and in preventing the wax from overflowing the top of the mold; and, *third*, in removing the mold with its solid wax deposit *before the mold has become heated to the temperature of the melted wax*. If any of these three things be omitted, we do not get the solidified casting, and we do not carry out the process of the patent.

20 In short, Claim 3 requires, as an essential, that a *cold* mold with its *bottom open* must be *quietly* lowered into the wax *only slightly* ( $20^{\circ}$  to  $40^{\circ}$ ) *above its melting-point*, and the mold must be removed *before it becomes heated*.

30 Another essential of Claim 3 is that the bore of the duplicate must be "finished" before the duplicate is removed from the matrix. "Finishing" is described in the Specification as trimming off the upper end of the duplicate flush with the surface of the mold, and in reaming out the bore with a suitable tool so as to produce concentric ribs.

40 Claims 4 and 5 are the same in substance as Claim 3. Claim 4 is identical in language with Claim 3, except that the last clause of Claim 3 says "and in *separating* the duplicate or matrix from the mold"; whereas Claim 4 uses the word "shrinking" instead of "separating." Claim 5 is identical in language with Claim 3, except that Claim 5 directs us to "finish" the bore of the dup-

licate "before the latter has become hard." I take this to mean that the physical operation of cutting or reaming out the bore of the deposit so as to produce the ribs must be performed while the material is still in what may be called a semi-plastic condition, and before it has resumed its normal hardness.

Q. 11. Do I understand you to say that Claims 3, 4 and 5 of the Miller & Aylsworth Process patent here in suit require that a *cold* mold must be immersed, and that precautions must be taken to prevent the mold from becoming heated?

A. That is absolutely correct. For instance, on page 1 of the Miller & Aylsworth Specification, *circa* line 40, the patentees say they make duplicates by a process of immersing the mold into the melted material, "whereby a coating or covering of such material will be *deposited* upon the interior of the matrix or mold by reason of the *lower temperature* of the matrix or mold" (italics mine). Again, on page 2, *circa* line 20, they say the mold is kept immersed in the melted wax for the time required "to secure a *deposit* of the wax-like material of the required *thickness*" (italics mine). They go on to say when a mold about a quarter of an inch thick is left in the wax at a temperature of about twenty to forty degrees above its melting-point, within three minutes a deposit of the desired thickness will have formed; that is, there will be present, deposited around the bore, a solidified mass of wax.

The patentees continue with the precaution that "*in no instance*" should the mold remain immersed "for a long enough time to allow its temperature to be raised sufficiently to permit the deposited molten material thereon to become remelted" (*circa* line 35 of page 2). Of course the use of the adjective "molten" just quoted is erroneous, because



if "molten" it could not become "re-melted." The patent continues:

"The *reduced temperature* of the matrix or mold relative to the temperature of the molten material causes the latter to become *coagulated* or chilled on the interior of the matrix, and to *deposit* thereon to the thickness desired" (italics mine).

10

This passage also can only mean that the mold must be *cold*, and must not be re-heated lest the solidified deposit "become re-melted."

Again, at line 50, the patentees refer to conditions where the composition would not normally become solidified on contact with an ordinary mold; in which case, the patent directs that the mold be made of increased thickness "or be *artificially cooled* before the dipping operation"—thus emphasizing the fact that the mold must be *cold* in the first instance and must be *kept* from heating.

20

Referring again to the Claims in suit, all three of them direct us to immerse the mold into the melted wax—yet not in a haphazard way, but *only* in a particular manner "whereby" the specified result will follow, namely: the securing (upon the bore of the mold) of a solidified deposit of the wax. The language of the Claims is "whereby the material will *coagulate* \* \* \* and *chill* \* \* \*" on the bore; and it must "coagulate" and "chill" on the bore "*in a layer* of the desired thickness." In order that the act of "immersing" can be performed in a manner "whereby" these results can be produced, the mold that is immersed must be *cold*. And in order that this deposited layer may be of the "desired thickness" (such a thickness as to permit subsequent reaming out), the mold must

30

40

the "molten wax" must not be much above its melting-point.

In short, the nature of the process, the language of the Specification, and the language of the Claims in suit—all require that the mold must be *cold*; that the wax must not be heated much above its melting-point; that the mold must not be allowed to reach the temperature of melted wax; and that the mold must be removed from the vat before the solidified deposit can be re-melted.

Q. 12. Please compare the process set forth by Claims 3, 4 and 5 of the Miller & Aylsworth process patent here in suit with the process set forth in Edison patent No. 667,662, granted Feb. 5, 1901, upon an application filed May 8, 1900—and particularly with reference to the process disclosed in Claims 2, 4 and 5 of the said Edison patent.

A. The Edison patent and the patent in suit describe the employment of a "continuous" mold (that is, a unitary or seamless mold, as distinguished from a mold made up of several parts). The wax-like sound-record material is melted and introduced into this mold, and is then allowed to cool and set,—and artificial cooling may also be employed, as by the application of cold water or of an air-blast.

The Edison patent discloses the cylindrical mold as having an open bottom, and mounted above a tank containing the melted "wax," and provided with a piston-plunger (having a core), which serves to draw the melted wax upward into the mold. Edison says the temperature of the mold is "relatively cold" (line 35 of page 2); and the melted wax being brought into contact with the cold surface of the bore of the mold will immediately be reduced in temperature and solidify (Edison, p. 2, col. 2).



At the top of the second column of page 2, the Edison patent says:

10 "The liquid molten material entering the mold 9 will engage all portions of the record formed on the bore thereof, and the *materially lower temperature* of the mold will result in the almost instantaneous chilling of the surface of the molten material therein" (*italics mine*).

20 The patentee then recommends the use of cold water or a blast of cold air for chilling the surface of the molten material; and says that this chilling "results in the *setting* of the positive impression thus secured"; and that as soon as the material has been chilled throughout its entire thickness (line 90 of page 2), the mold with its contents are removed from above the tank and "allowed to cool by exposure to a cold atmosphere or by an air-blast until the solidified material has contracted away from the bore of the mold, so as to permit it to be removed therefrom by forcing the plunger downward."

30 The passages just cited show in the first place a two-step cooling process; and in the second place, that the casting is *disengaged* from the bore of the mold by reason of its shrinkage due to the cooling, and is *removed* from the mold by a direct longitudinal movement.

40 The gist of this Edison process I understand to be the use of a *cold* mold with a melted material, the introduction of the melted material into contact with the cold bore of the mold (whereby the material is solidified so as to produce a deposit), the allowing or causing the material to set (so as to become a hardened casting), and the withdrawal of the casting from the bore. Not only is the mold cold to begin with, but there is nothing to raise its temperature except the slight amount of molten

material brought in contact with it, the air circulating around the outside of the mold will tend to counteract any rise of temperature imparted to the mold.

Claims 2 and 4 of the Edison patent inquired of clearly and concisely describe this process. These two Claims are the same in substance. The first step in each Claim is said to consist in securing the mold. Having the mold and the melted wax, the succeeding steps may be formulated as follows:

- (1) Introducing the melted wax into the mold;
- (2) Allowing the molten wax to set (become solidified);

- (3) Contracting the set material (which I understand to mean, "applying cold water or cold air to the already solid, but still *warm* casting"), in order to cause the same to shrink away from the mold so as to leave an annular space separating the casting from the mold; and

- (4) Removing the casting, or duplicate sound-record, from the mold by a direct longitudinal movement.

Comparing the process claimed by Claims 2 and 4 of the Edison patent No. 667,662, with Claims 3, 4 and 5 of the Miller & Aylsworth process patent here in suit, and noting that the Miller & Aylsworth process requires that we must have a continuous or unitary mold (as in the Edison patent), and that this mold must be *cold* as described in the Edison patent, I find that the process called for by Claim 3 differs from the process of the Edison patent in the following respects:

- (1) Where Edison merely says he *introduces* the melted wax into the mold, Miller & Aylsworth introduce it by "immersing" the mold *in the particular manner already pointed out*. If "immer-



sion," as used in Miller & Aylsworth's Claim, means merely the submerging of the mold in order to fill it, there would be no difference between this proceeding and the corresponding step that Edison employs. In order to bring to light the difference, in this respect, between the two processes, we must bear in mind that Miller & Aylsworth immerse their mold in the *particular* manner "whereby" the specified results are to be obtained;

(2) The second step in the Edison patented process is the "allowing the molten material to set," which is done with the mold in the open air; whereas the corresponding step in the Miller & Aylsworth Claims (the solidifying of the material upon the bore of the mold, in a layer of the desired thickness) is brought about while the mold is *submerged*;

(3) As the third step the process of the two Edison Claims calls for the additional cooling of the casting, so as to shrink it away from the mold; whereas Miller & Aylsworth undertake to "finish" the bore of the casting before they shrink it away from the mold;

(4) Each patented process removes the cast duplicates from the matrix in the same manner.

In short, I find the process claimed by the three Claims of the Miller & Aylsworth patent in suit to be broadly the same as the process claimed by Claims 2 and 4 of the said Edison patent No. 667,662; but that the Miller & Aylsworth process differs specifically from the patented Edison process in (1) obtaining the *solidified* casting *while the mold is submerged*, and (2) in finishing the duplicate before it is removed from the mold.

Claim 5 of the said Edison patent is the same in substance as Claims 2 and 4 already considered, except that it specifies that a core is employed in the center of the mold, around which core the molten material is introduced,—which causes the

casting to be hollow. This is another respect in which the process of Miller & Aylsworth departs from the process of the Edison patent, namely, in dispensing with the central core.

Q. 13. Please compare defendant's process with Claims 3, 4 and 5 of the Miller & Aylsworth patent in suit?

A. Defendant's mold is provided with a core, and in this respect is like the mold of the Edison patent No. 667,662 (just referred to), and is unlike the mold of Miller & Aylsworth. Defendant's mold is filled with the melted wax *from the top*, as distinguished from filling from the bottom as in Edison and Miller & Aylsworth. Defendant's melted wax is allowed (or caused) to solidify while the mold is in the air, as in *Edison's* process—and not while the mold is submerged as in Miller & Aylsworth's process. Defendant's cast duplicate is then chilled by the application of cold water, and subsequently by a cold air-blast, just as in the *Edison* patent referred to, as distinguished from the Miller & Aylsworth process which first allows the material to set (in the air), and then applies cold water. Defendant's molded duplicate is scraped out while in the mold, but is "finished" after its removal from the mold, as in the *Edison* patent, as distinguished from *finishing* the duplicate *before* removing from the mold (as in the Miller & Aylsworth process).

Thus it is clear that defendant's process is more like the process claimed by Claims 2 and 4 of the Edison patent No. 667,662, than it is like the process of the Miller & Aylsworth patent in suit.

But defendant's process differs very radically from both Edison's and Miller & Aylsworth's in the essential feature that whereas in the two patents the melted wax solidifies immediately upon coming in contact with the cold mold, and whereas in the two



patents the cold mold is not allowed to become heated,—in defendant's process the mold is brought to a temperature of 150° above the melting-point of the wax, and this high temperature of the wax and the mold is *maintained* for an appreciable time.

10 This distinctive difference between defendant's process on the one hand, and the process broadly common to the Edison patent and the Miller & Aylsworth patent on the other hand, is clearly stated by Judge PLATT in the decision already referred to. The language applied to the Edison process in that decision is also applicable to the Miller & Aylsworth process. Judge PLATT said:

20 "Air bubbles in the melted material drove Mr. Edison away from casting for many years, but in this patent he reverts to casting, and avoids air bubbles by introducing the melted wax *from the bottom upwardly* into a very cold mold, so as to produce an almost *instantaneous chilling* of the wax."

And the foregoing epitome of the Edison patent is true of the Miller & Aylsworth patent in suit. Judge PLATT continues:

30 "Defendant undertakes to get rid of the air bubbles by *superheating* the melted wax after it has been poured into the mold *at the top*, and then proceeds to suddenly chilling it down from its high temperature. This is done under Letters-patent No. 682,991 and 682,992, Sept. 17, 1901. Mr. Macdonald discovered that he could do this when in molding blanks in 1896 \* \* \* and this knowledge led directly to the defendant's patents. \* \* \* Mr. Edison [and Miller & Aylsworth] eliminates air bubbles by *one* process, and the defendant eliminates them by *another* and *distinctively novel* process." (Italics mine.)

40 *National Phonograph Co. vs. American Graphophone Co.*, 135 F. R. 814.

Q. 14. Do you know whether or not the Edison patent No. 667,662, above referred to by you, was involved in the suit before Judge PLATT, from which you have just quoted; and, if so, which Claims thereof?

A. The Edison patent No. 667,662, above referred to, was involved in the case reported in 135 Federal Reporter, and was the patent of which Judge PLATT was speaking in the quotation just given. The complainant declared on Claims 1, 2, 4 and 5 thereof. The Bill of Complaint was dismissed with costs, by a Decree entered March 30, 1905. I believe Mr. Mauro, in his deposition, has already set out the fact that this decision has been acquiesced in by the complainant therein. 10

Q. 15. Have you read the Aylsworth & Miller Apparatus patent No. 683,676, here in suit, and do you understand the same?

A. I have read the said patent, and I believe I understand it. 20

Q. 16. Will you please indicate, for the convenience of the Court, the concrete features shown and described in the said patent, corresponding to the several elements recited in Claims 6 and 7 of the said Aylsworth & Miller patent?

A. This apparatus is stated in the patent to be for carrying out the process disclosed by the Miller & Aylsworth process patent already considered by me. The two patents were issued on the same date, upon applications filed in the Patent Office on the same date. Speaking broadly, the apparatus comprises a tank or vat containing the melted wax, and having beneath it a gas burner or other source of heat; an open-bottomed cylindrical mold, having a can or shell surrounding it to protect the outside of the mold, and having a collar or "cap" at the top to prevent the material from flowing over at the top; and a handle by means of which the mold and 30 40



its surrounding parts can be lowered into the tank and drawn up again. The bore of the mold contains a reverse of the original sound-record; and in the bottom of the hollow mold is arranged a reverse name-plate, so that the casting will present any desired lettering. I have said that the mold was "open-bottomed." At the bottom of the mold is a disc having a large hole in its center, so as to provide an annular ledge or seat around the bottom of the mold. The reverse letters or characters (to be imparted to the duplicate) are upon this ledge.

In addition to the foregoing, the patent shows and describes a reaming-device, comprising a revoluble chuck and an adjustable reaming-knife.

I will now refer specifically to Claims 6 and 7. These two Claims are the same in substance. Claim 6 calls for only two positively-recited elements, namely: means for securing the solid casting; and means for finishing the interior of the latter. That is, the first element can be found in Fig. 1 (and in Fig. 1 *only*), and the second element in Fig. 2 (and in Fig. 2 *only*).

Claim 6 specifies the second element as "means for *finishing* the interior of the duplicate," etc.; where Claim 7 specifies the second element as "means for forming \* \* \* a series of concentric ribs \* \* \*"; but the only means for finishing (Claim 6) is the reaming device of Fig. 2, which is the means for producing the series of ribs called for by Claim 7.

The first element is said to be—

"means for *securing* a *deposit* of a wax-like coagulable material *upon the bore* of the record-matrix." (Italics mine.)

The word "deposit" indicates the "coagulated" or *solidified* wax—as distinguished from the "mol-

ten" or *liquid* wax. "Securing" this deposit conveys the same idea; we *might* get a liquid deposit upon a surface, but it would not be *secured*, until it had become solid so as to remain. The *securing* of a "deposit" *upon the bore* of the matrix, emphasizes the same idea. In short, the "means" constituting the first element of Claims 6 and 7, must be some instrumentality or instrumentalities by which we can obtain the desired casting, in the form of a solid deposit, and *upon the bore* (and not "throughout the entire hollow concavity"); and this "means" must be the instrumentalities "substantially as set forth" in the Specification and Drawing, viz: the tank (11) having melted wax; the cold mold (1), having an opening (6) in its bottom through which the melted material can rise; together with the shield (8) to keep the mold from becoming heated. The "means" under discussion also requires that this cold mold must not be allowed to remain in the tank (11) until the mold has become heated,—otherwise there would no longer be means for *securing* the wax in the form of a deposit "upon the bore."

In short, the first element of Claims 6 and 7 consists of the precise apparatus shown in Fig. 1, or a colorable imitation thereof.

The second element of the two Claims, namely, means for "finishing" the interior (Claim 6) or for forming the ribs (Claim 7), is the reaming apparatus of Fig. 2. I note that these two Claims speak of these two elements as comprising a "combination." I understand that the word "combination," in reference to mechanical structures, means that the elements "in combination" *co-operate* with each other to produce a single or unitary result; that although such elements need not be acting *simultaneously*, yet there must be a *co-operation*,



in the sense that the operation of one element must affect (or be affected by) the operation of the other element. There is no such co-operation or mutual effect existing between the two elements of Claims 6 and 7 of this Aylsworth & Miller patent in suit. To say that there is a "combination" or "co-operation" between the devices of Fig. 1 and the devices of Fig. 2, seems to me like speaking of the "combination" or "co-action" between the carpenter's plane, with which a plank is smoothed, and the paint-brush with which the planed surface is subsequently covered with paint. The two implements (plane and brush) do contribute to produce the single result, a smooth painted board; but they do not *co-act*. Neither one modifies (or contributes to) the action of the other.

In like manner, after the "means" constituting the first element of the Claim, as disclosed in Fig. 1, have performed their part of the work, so that we have a solid casting with an irregular bore, this casting could be taken out of its mold and either used just as it is (which would doubtless be rather unsatisfactory) or smoothed out by *any* finishing implement. In short, the first-named "means" has performed its function and the result accomplished is the same, whether we do or do not employ the second-named "means." And in like manner, the second-named "means" could be employed upon any hollow cylindrical object of wax-like material, whether a blank cylinder or any other object; the operation of the second-named "means"—the reaming-apparatus—is not dependent upon, and is not in any manner affected by, the operation of the first-named "means."

Q. 17. What novelty do you find in the apparatus set forth in Claims 6 and 7 of the Aylsworth & Miller patent in suit?

A. As there is no real co-action or combination

between the two elements recited in these Claims, I will consider each of the two elements separately.

The first element of Claims 6 and 7 I find in the Edison patent No. 667,662, already referred to, granted Feb. 5, 1901, upon an application filed May 8, 1900. That patent discloses "means for securing a deposit of a wax-like coagulable material upon the bore of a matrix or mold which carries the representation of the record to be duplicated," (as called for by the Miller & Aylsworth Claims 6 and 7), consisting of the following parts found in Edison's Drawing, namely: the tank (1) containing the molten material; the *cold* cylindrical record mold (9), open at its bottom, and located above the tank; and the piston-plunger (4—7) for raising into the mold, from the bottom, the melted wax, which is coagulated immediately upon coming in contact with the cold matrix-surface (9).

The second element of the Aylsworth & Miller Claims 6 and 7 in suit, the means for reaming, etc., is found in the said Edison patent and elsewhere. It is true that the Edison patent speaks (line 113 of page 2) of reaming the cast duplicates to the proper size, *after* Edison has spoken of removing the duplicates from the mold. But the reamer could be applied to the duplicate *before* the latter has been removed from the mold. In fact, any reamer for duplicate sound-records could be applied to such duplicates either before or after they are taken from the mold. Therefore, the said Edison patent discloses not only the first-recited element of Claims 6 and 7, but also "means" *adapted or suitable or capable of use* "for finishing the interior of the duplicate while the latter is in position within its mold" (Claim 6) or *adapted or capable of use* "for forming in the duplicate while the latter is in position in the mold a series of concentric ribs," etc. (Claim 7).



Moreover, if there be any "combination" between the two "means" recited in Claims 6 and 7 of Aylsworth & Miller, there is just as much combination existing between the apparatus illustrated in Figs. 1 and 2 of the Edison patent referred to and the reaming apparatus referred to in the second column of page 2 of the said Edison patent No. 667,662.

10 I have referred specifically to this Edison patent, not because it is the only one, but because I have it conveniently at hand, and because this patent in particular seems to me to be nearer kin to the Aylsworth & Miller patent in the particular apparatus employed. If Claims 6 and 7 mean the combination of *any* means for getting a cast sound-record and *any* means for reaming out the bore of such casting, then the Claims are anticipated by almost any of the prior patents which disclose the  
20 production of cast sound-records, because the reaming out of the bore of such castings has been a common practice.

Q. 18. In answering the previous questions, did you take into consideration the fact that Claim 7 specifies that the ribs to be produced are "concentric ribs" and not a continuous spiral rib?

A. I did, but I will point out that in the Edison patent No. 414,761, granted Nov. 12, 1889, reference is made in general terms to—

30 "providing the interior of the cylindrical phonogram-blank, with ribs, flanges, or projections \* \* \* " (line 20).

And Edison says:

"I *prefer* to form a spiral rib."

This is a disclosure of "ribs" in general and "spiral ribs" in particular. The only internal ribs other than spiral that would naturally occur to one are  
40 either *longitudinal* ribs or *concentric* ribs. This

same Edison patent likewise refers (near the top of the second column) to *reaming out the interior* of the phonogram-blanks." It is true that the reference does not refer to reaming these blanks out so as to produce ribs, but it shows that the reaming out of phonogram-cylinders was practiced and well known long before the date of the Aylsworth & Miller patent in suit.

U. S. patent No. 185,054, granted Dec. 5, 1876, to Wilder, shows a chuck having a tapering bore in which a frusto-conical hollow article is inserted and revolved in order to ream out its interior face. In Wilder's drawing, A is the chuck and C is the tapering hollow article. The chuck and the article are revolved by the shaft B. Not only is the interior of the article reamed out, but a (concentric) groove is cut near one end thereof. The cutting of a plurality of such grooves, leaving a plurality of "concentric ribs" would be obvious if such concentric ribs were desired.

I will call attention also to Edison patent No. 393,462, granted Nov. 27, 1888, as illustrating the practice of *reaming out the interior* of the cylindrical phonogram-blanks. Edison patent No. 393,463, granted Nov. 27, 1888, illustrates an apparatus for the same purpose, although these two Edison patents do not disclose any concentric ribs (but merely a continuous taper bore). But, since the Edison patent No. 414,761 (above referred to) discloses the production of internal ribs, both *spiral* and of other forms, there would be nothing novel in producing concentric internal ribs by reaming, in view of the Wilder patent of 1876 above referred to.

Although, for producing the *spiral* rib of the Edison patent No. 414,761, Mr. Edison says he prefers to employ a core containing a spiral groove,—whereby the spiral rib is formed by the casting operation,



yet, since he indicates other forms of ribs, which I understand to be either longitudinal or concentric; and since a core containing concentric grooves around which there should be produced (by casting) a phonogram-blank having concentric ribs, could not be removed from the casting,—the said Edison patent No. 414,761, teaches us that we may produce a cast phonogram cylinder, and ream out its bore to obtain concentric ribs.

In fact, without looking for any patent or reference, it is a matter of common knowledge that woodworkers and metal-workers can produce, by means of the ordinary turning-lathe, a series of concentric ribs around the outside of an article. And I think that it has likewise been a matter of common knowledge for years that they could also produce a series of concentric rings or ribs upon the *inside* of tubular articles. There could be nothing novel in reaming out the bore of this particular tubular article (cast sound-record) to produce concentric rings.

Q. 19. Please compare defendant's apparatus with the apparatus set forth in Claims 6 and 7 of the Aylsworth & Miller patent in suit.

A. The apparatus claimed by Aylsworth & Miller consists of the two elements named, viz: the particular instrumentalities shown in Fig. 1 and the apparatus shown in Fig. 2, the two elements being alleged to constitute a "combination." As I have already explained, the first "means" recited in these two Claims could not be considered as *any* instrumentalities for obtaining a cast sound-record, but require the use of a *cold* mold, also the protection from (and the prevention from) raising the temperature of this mold to the melting-point of the wax etc. Defendant's apparatus comprises an ordinary mold and means *for heating this mold* far above the temperature of the melted wax, such "means" *preventing* the formation (or "securing") of a deposit

upon the bore of the mold. In short, defendant's "means" for obtaining its cast sound-record is entirely different from the "means" recited in Claims 6 and 7 of the Aylsworth & Miller patent in suit.

With regard to the second named "means" of these Claims, as I have pointed out, any reamer or other device for finishing the interior of the cast cylinder could be employed for that purpose either (after) the casting has been removed from its mold, or *before* the casting has been removed; consequently, any reaming-tool used with a record-cylinder is "means for finishing the interior of the duplicate, *while the latter is in position within the matrix or mold.*" But, I understand from the testimony given herein by Mr. Macdonald, that in defendant's factory, although the interior of defendant's cast sound-records is "scraped" while the casting is still in position within its mold, yet the *finishing* is done *subsequently*, after the casting has been removed.

In short, defendant's apparatus is not the alleged "combination" recited in Claims 6 and 7 for two reasons: (1) defendant does not employ the first-named "means" of these Claims, nor (2) does defendant employ the second-named "means."

If defendant's apparatus and the apparatus of the two Claims in suit were substantially the same, they could be operated in substantially the same manner to produce substantially the same results, but this is not the case. The patented apparatus is intended for carrying out the process of the Miller & Aylsworth process patent in suit, by which the solidification or coagulation of the wax is obtained immediately upon wax coming in contact with a cold mold, while the mold is still immersed; and when the mold is withdrawn from the vat, it brings with it the already-formed and solidified



casting. Defendant's apparatus could not produce this result: The defendant's apparatus comprises the tank containing *abnormally hot* wax, and there is no means provided for preventing the metal mold from becoming heated to (and above) the melting point of the wax; consequently defendant's apparatus could not produce a coagulation of the wax upon the bore of the mold, and defendant's apparatus could not bring out from the vat an *already-solidified* casting. On the other hand, defendant's process could not be practiced by the Aylsworth & Miller patented apparatus: Defendant's process involves the superheating the wax while it is in contact with the mold, which results in the superheating of the mold itself, to a temperature far above the melting point of the wax; and the mold of the patented apparatus could not be thus heated on account of shield 8 which excludes heat from the exterior of the mold.

Considering that defendant's apparatus and the patented apparatus are both intended for the production of cast sound-records, it is difficult to conceive of two instrumentalities in the same art that are so radically different in essential points.

Q. 20. Please state for the convenience of the Court what are the concrete things recited by Claim 5 of the Aylsworth & Miller patent in suit?

A. Claim 5 differs from Claims 6 and 7 in two respects: First, it does *not* include the reaming or finishing apparatus; and second, it *does* refer to the reverse letters or characters for producing in the casting a suitable designation of the selection.

The positively-recited elements of Claim 5 are three, namely:

1. The record-mold;
2. A disc at its bottom, carrying the reverse designation of the sound-record; and

3. "Means for depositing molten material  
\* \* \* "

If we should consider this Claim absolutely without any reference to the specification and drawings, so as to understand that the Claim recites the employment of *any* mold, with any closure at its bottom carrying reverse letters or characters (to be imparted to the product), and *any* "means" for filling the mold,—such apparatus would, of course, be absolutely lacking in novelty. The only respect in which such apparatus would differ from any mold at all with a ladle or other means for filling the mold, would be in the employment of the reverse characters to be imprinted in the casting. But this is a very common expedient. I refer, for instance, to U. S. Letters Patent No. 359,637, granted March 22, 1887, to Schuberth for a Soap Press. Schuberth, in lines 91-3 says:

"The die D may be engraved to produce the impression upon the soap of a monogram, trade-mark, or other character."

If, however, we consider Claim 5 in suit in connection with the specification and drawings, then it is clear that the mold and disc referred to must have a large opening in the bottom to permit the melted wax to enter the mold; and in order to "deposit" the wax, the mold and its disc must be *cold*, means (such as shield 8) must be provided to protect the outside of the mold from being heated; and means must also be provided for withdrawing the mold from the vat *before the mold becomes heated*. The use of the word "depositing" in Claim 5, instead of the word "introducing," is significant. It has the same meaning as the phrase "securing a deposit" in Claims 6 and 7; it means the same thing as the expression "to secure a deposit" in line 3 of



page 2 of the specification; and the same as the phrase "to deposit thereon" in line 9 of page 2. Therefore, as already indicated, the positive elements called for by Claim 5 may be stated as follows:

- 10       1. A cold mold having a shield or other means for protecting its exterior from heat, and having an opening in its bottom to admit the melted wax;
2. A disc having a large opening in it and seated beneath the mold, and containing reversed letters; and
3. Certain specified "means," comprising a vat containing melted wax, the openings 6 giving access from the bottom upward into the mold, and the *coldness* of the mold, as well as the other means for preventing the mold from becoming heated.

20       Q. 21. Please compare the apparatus of Claim 5 in suit with the apparatus shown and described in the Edison patent No. 667,662, granted Feb. 5, 1901, and also compare the apparatus in Claim 5 with defendant's apparatus.

30       A. If Claim 5 be read with *utter* disregard to the specification and drawings, I find precisely the same elements in the said Edison patent—except the use of the reverse letters for imprinting the designation of the sound-record. Thus, the first element of Claim 5 is the mold which is indicated by reference-numeral 9 in the said Edison patent; the disc upon which the mold is said to be "seated" is the disc or piston 4, which, in Edison's Fig. 2, *closes the bottom* of Edison's mold 9; and the Edison patent shows "means for depositing molten material within the matrix or mold\* \* \* whereby the duplicate record will be formed \* \* \*." In short, if Claim 5  
40       be read with *utter* disregard to the Aylsworth & Miller Specification, it could be read literally upon the

said Edison patent, except for the use of the old expedient of reversed letters for imparting a designation to the cast article.

But giving to Claim 5 its proper meaning, then I find the following resemblances:

1. Edison and Aylsworth & Miller have the same cylindrical record-mold, but the Aylsworth & Miller mold carries positive means (specifically shield 8) for protecting the outside of the mold from contact with the wax, while Edison does not. In this respect defendant's mold is like Edison's mold. The Aylsworth & Miller mold is open at its bottom, and so is Edison's, and means are provided to prevent the wax from flowing over the top; while defendant's mold is closed at its bottom and is open at its top and the wax is *caused* to flow over the top. Miller & Aylsworth and also Edison provide means for preventing these molds from becoming heated; whereas defendant provides, and actually uses, means for causing his mold to become *very hot*.

2. As to the second element, the disc carrying the letters, this disc is not intended as a closure, but merely as a convenient location for the letters. The Edison mold is open-ended as is the Aylsworth & Miller, but it does not carry the reverse letters. Defendant's mold has an actual closure at its bottom, in which reverse letters may be placed. This is the only respect in which the defendant's apparatus approaches nearer to the Aylsworth & Miller apparatus than to the Edison apparatus.

3. The third element of Claim 5 is the "means" indicated. This "means" comprises, among other things, the *cold mold* and other features which I need not repeat. These features are found in the Edison patent, viz: means for making use of the underlying principle of the companion Miller & Aylsworth process patent, namely, the principle



that melted wax when applied to a cold surface will become chilled and will solidify. This third element of the Aylsworth & Miller Claim 5 in suit is substantially identical with the corresponding features of the said Edison patent, and is radically different from any "means" employed by defendant for obtaining its solidified casting.

10 In short, when I compare the apparatus in Claim 5 (either as a whole, or considering the elements separately) with the said Edison apparatus and with defendant's apparatus—a triangular comparison, I find that the Aylsworth & Miller apparatus is substantially like the Edison apparatus, and the two patented apparatuses are radically different from defendant's apparatus. The sole point of similarity that can be observed with respect to defendant's apparatus and Aylsworth & Miller's is the use of the reverse lettering. This, as I have hitherto pointed out, is a *common expedient*.

20 Q. 22. Before closing this examination, I will ask you to consider again the principle of the Miller & Aylsworth process and the mode of operation of the Aylsworth & Miller apparatus, in connection with U. S. Letters-patent No. 95,645, granted Oct. 12, 1869, to Brunner, for Casting Hollow Articles?

30 A. Hitherto, in considering these two patents in suit, I have in the main confined myself to stating what the Claims recited, and to comparing the same with defendant's process and apparatus. The underlying principle of the two patents in suit consists, first, in submerging an open-bottom cold mold into melted material, whereby (1) the material will rise from the bottom upward into the bore of the mold, and (2) the melted material upon coming in contact with the cold mold will instantly chill and become solidified in a layer against the bore of the mold; and, second, in withdrawing the mold from  
40 the vat containing the melted material *before* the

solidified deposit can re-melt, whereby the remaining contents of the mold will run out at the bottom and leave a hollow casting.

I find these same features illustrated and described, and also claimed, in the Brunner patent No. 95,645 of Oct. 12, 1869. Brunner's mold A is of metal and he tells us it is *cold*. His mold is open at the bottom B. It is lowered into a vessel containing the melted material (which is spoken of as "metal"). He says that the fluid material coming in contact with the cold mold will become chilled to a certain extent, according to the time the mold remains in the melted metal, *forming a thin shell*. After the mold has been immersed a sufficient length of time, it is drawn out, leaving the material that has not become solidified to run back into the vessel.

Broadly considered, the only difference between Brunner's apparatus and the apparatus of Miller & Aylsworth is that Brunner employs a two-part mold (which is necessary because his castings were of irregular shape), whereas Miller & Aylsworth employ a unitary mold (because their casting is a cylindrical article which can be withdrawn from such a mold). This difference, however, is absolutely immaterial for the reasons already stated, including the extract from Judge PLATT's opinion found on page 814 of 135 Federal Reporter.

Broadly considered, there is no difference between the *process* of Brunner and the process of Miller & Aylsworth. The *process* is the same whether the mold be a unitary continuous mold or a two-part one. The mold is taken *cold* and the material in molten condition, in each case; the cold mold is immersed into the melted material which rises from the bottom so as to completely fill the mold in each case; the melted material chills and solidifies upon



the bore of the mold to form a layer, in each case; and the mold is withdrawn before the solidified layer can be re-melted, and the un-solidified contents run out of the bottom, in each case.

10

Defendant's counsel offers in evidence the various publications and patents referred to by the witness Massie during his direct examination, and it is stipulated that the three books referred to were published upon the dates recited in their title pages, that the various patents were issued upon the dates appearing on their various faces, upon applications filed upon the respective dates recited in each patent, subject, of course, to correction for error upon due notice.

20

It is further stipulated that the books offered in evidence may remain in possession of defendant's counsel, to be produced if called for.

The exhibits are now marked "Defendant's Exhibits," with the following respective designations:

30

"Scientific American Cyclopedia of 1893;"  
"Grove & Thorp of 1895;"  
"Soap & Candles of 1896;"  
"British Patent to Field & Humfrey of 1856;"  
"Cowles Patent No. 86,059;"  
"Bingham Patent No. 182,547;"  
"Bingham Patent No. 419,914;"  
"Fournier Patent No. 545,356;"  
"Appelt Patent No. 303,970;"  
"Lioret Patent No. 528,273;"  
"Young's British Patent of 1894;"  
"Edison Patent No. 667,662;"  
"Wilder Patent No. 185,054;"  
"Edison Patent No. 414,761;"  
"Edison Patent No. 393,462;"  
"Edison Patent No. 393,463;"  
"Schuberth Patent No. 359,637;"  
"Brunner Patent No. 95,645."

40

Defendant's counsel also offers in evidence, as a

physical exhibit, a certified copy of the "File-Wrapper and Contents" of the Joyce patent here in suit; and it is noted that the said file-wrapper and contents down to and including the Patent Office communication of Oct. 16, 1902, formed an exhibit on behalf of the complainant National Phonograph Company in the suit against defendant in Connecticut based on the Edison patent No. 713,209, decided by Judge PLATT, whose Opinion is reported in 135 Fed. Rep., 810. The rest of the File-Wrapper and Contents are now presented in a separate certified typewritten copy, as a physical exhibit.

10

The witness Massie is now offered for cross-examination at a date to be agreed upon by counsel between the respective parties.

Defendant's counsel produces two volumes containing the printed "Transcript of Record," consisting of the pleadings, testimony and exhibits in the suit based on Edison patent No. 713,209, entitled the National Phonograph Company vs. American Graphophone Company; and requests that the same be marked for identification as "Defendant's Exhibit, Transcript in Connecticut Suit on Edison Pressing Process."

20

Defendant's counsel likewise produces two volumes containing the printed Transcript of Record, the same being the pleadings, testimony and exhibits in the companion suit to the above, based on Edison patent No. 667,662, entitled the National Phonograph Company vs. American Graphophone Company; and requests that these volumes, be marked for identification as "Defendant's Exhibit, Transcript in Connecticut Suit on Edison Casting Process."

30

Adjourned subject to notice.

NEW YORK, January 15, 1908.

Met pursuant to agreement at the office of Philip 40



Mauro, Esq., 154 Nassau Street, New York City, at  
2 p. m.

Present:

HERBERT H. DYKE, Esq., for Complainant;

RALPH L. SCOTT, Esq., representing

PHILIP MAURO, Esq., for Defendant.

10 By Mr. DYKE:

It is noted with respect to the stipulation made at the close of the last session, that certain of the exhibits, patents, and books referred to therein are not set up in the Answer. By entering into this stipulation, counsel for complainant does not wish that he be understood as assenting to the introduction in evidence of the various patents and books referred to in the answer to Q. 6, but desires to be understood only as assenting to the statements contained in the stipulation if it be held by the Court that the said patents and books referred to in the answer to Q. 6, are competent evidence.

20

Counsel for complainants objects to question 6 and the answer thereto, and the introduction in evidence of the exhibits termed "Defendant's Exhibits, Scientific American Cyclopedia of 1893;" "Grove & Thorp of 1895;" "Soap & Candles of 1896;" "British Patent to Field & Humphrey of 1856;" "Cowles Patent, No. 86059;" "Bingham Patent No. 182,547;" "Bingham Patent No. 419,914;" "Fournier Patent, No. 545,356," on the ground that none of them is set up in defendant's Answer in the Joyce suit, and complainants' counsel further gives notice that a motion will be brought as soon as possible to have question 6 and its answer stricken out, and the exhibits referred to excluded from the record.

30

Defendant's counsel replies that the statutes and practice do not require that every patent or other exhibit presented in evidence must first be pleaded in the Answer; and defendant now

40

gives notice that if complainants bring the motion just referred to, defendant will bring a motion returnable at the same return day, for leave to amend the Answer in the suit on the Joyce patent by inserting in paragraph 8 thereof, such of the references above referred to by complainants' counsel, as it may appear to defendant necessary or desirable to insert in the Answer.

x-Q. 23. Have you ever before testified as a patent expert in a patent case?

A. I have not. But I have occasionally given affidavits in patent cases, as a patent expert. And I have also quite frequently given expert opinions touching novelty or infringements of patents, at the request of clients.

x-Q. 24. You are the same C. A. L. Massie who is of counsel in each of the three cases in which this testimony is being taken, are you not?

A. At the end of the first paragraph of my answer to Q. 1, I stated that I had been of counsel for the defendant in nearly all of its patent suits during the past ten years. I am one of the solicitors for defendant in the suit on the Miller & Aylsworth Process patent, and in the suit on the Aylsworth & Miller Apparatus patent. I am of counsel for defendant in all three of the suits here consolidated, but I cannot say at the moment whether I am one of the solicitors in the Joyce suit.

x-Q. 25. You cross-examined witness Holden, who gave an expert deposition in behalf of complainant in the suit on the Joyce patent, did you not?

A. I did. I believe I appeared for defendant at the examination of all of complainant's prima facie witnesses in the Joyce suit, and conducted the cross-examinations.

x-Q. 26. I understand, then, that at least, so far



as the Joyce suit is concerned, you stand in a dual position of giving an expert deposition, which is substantially an answer to an expert deposition of which you conducted the cross-examination, is that correct?

10 A. If your question means to assert that I have been of counsel for defendant in the Joyce suit, and, as such, cross-examined complainant's prima facie witnesses, and am now on the stand as an expert witness for defendant, you are correct. Whether or not my direct deposition is "substantially an answer" to Mr. Holden's deposition, is scarcely a matter of testimony. I will state, however, that in giving my deposition I was not consciously attempting to "answer" Mr. Holden's deposition.

20 x-Q. 27. In your direct deposition you state that you were assistant Examiner in the U. S. Patent Office for nearly four years. Did you examine the talking-machine art in that capacity?

A. I did not. My acquaintance with the talking machine art began in January, 1898, almost immediately after I left the Patent Office and became associated with Mr. Mauro.

30 x-Q. 28. In your answer to Q. 4 you speak of the practice in vogue since the "early 90's" in the making of blank cylinders for use on talking-machines. I understand that you were not then speaking from anything in your own experience?

A. So far as anything prior to 1898 is concerned, I was not.

In view of the preceding answers complainant's counsel objects to the second paragraph of the answer to direct question 4 as hearsay and incompetent.

40 x-Q. 29. Near the end of the next to the last paragraph of your answer to Q. 4, you speak of "melted wax." Please define what you mean by this term.

A. By "wax," I mean the wax-like composition commonly employed for making sound-records, which in general terms contains free stearic acid, a smaller amount of stearic acid that has been saponified by sal-soda or caustic soda, or both, a slight amount of some form of aluminum, and a hydrocarbon wax such as paraffine or ceresin.

By the use of the word "melted" in the passage you inquire of, I intended to refer to the melting-point of the wax composition. Of course when the composition has become liquid it is "melted wax;" but it might be heated much higher and still be "melted wax." What I meant to say was that in defendant's process the mold is raised to a temperature far above the melting-point of the wax. 10

In my opinion, the simple expression "melted wax," without any further explanation, means wax at substantially its melting point. 20

x-Q. 30. Your answer does not seem consistent. I ask you, then, if you had a vat of wax whose melting-point is, say 250° to 280°, and the vat and its contents were raised to a temperature of say 400°, would or would not the vat contain "melted wax"?

A. As you regard my previous answer as "inconsistent," I shall have to answer not merely in the affirmative, but add an explanation.

The vat you inquire of *would* contain "melted wax." But the vat would also contain melted wax when the wax was only about 280° in temperature. If, dealing with a wax composition having a melting point of somewhere between 250° and 280°, I were asked to fill the vat with the *melted* wax, and no further instructions were given, I would fulfil the requirement by having the wax in the vat at the temperature indicated, namely, somewhere around its melting-point. The thing that one would understand was wanted would be to have that wax in a 30 40



melted or liquid condition. And unless some further instruction were given, it would be volunteered and superfluous to raise the temperature of the wax substantially beyond its melting-point.

10 x-Q. 31. In the same portion of your testimony you say, "defendant's process consists emphatically in subsequently raising the temperature of the mold until it becomes heated far above the temperature of melted wax." In view of the response by the witness Macdonald to x-Q. 43, I ask you what is meant, in your testimony above quoted, by "defendant's process"?

20 A. By "defendant's process" I mean, and in answer to Q. 4 I meant, having the wax at a temperature of about 400° F., in a large tank beneath which heat was applied; in submerging a solid-bottomed cylindrical record-mold, at normal room temperature, into the mass of the very hot molten wax; permitting the mold to remain submerged and in contact with the superheated wax, until the mold was raised to the same temperature as the wax, some 30 150° above the melting point of the wax; in then withdrawing the mold from the vat and plunging it at once into cold water, where it remained until the wax had become solidified and the "casting" had been formed; and in subsequently removing the mold with its solid casting from the cold water; and finally scraping out the interior of the casting, subjecting it to cold air to lower it to normal temperature, and "finishing" the cast duplicate.

40 I also had in mind the process, which in principle is the same, where a jacketed mold is employed, and steam is introduced into the space around the mold and enclosed by the jacket, either simultaneously with, or before, or after, the introduction of the wax, whereby the temperature of the mold and its contents is maintained for a considerable time; and subsequently the introduction

of cold water in place of the steam, whereby the "casting" is chilled suddenly and symmetrically from the exterior. With regard to the process just described, I understand from Mr. Macdonald's testimony, that the particular apparatus employed—the steam jacketed mold—was employed by him about 1896 and subsequently; and was discontinued some years ago,—the large vat containing a mass of superheated "wax" being used instead.

10

In a general sense I regard these two methods of manipulation as "defendant's process," since both have been employed by defendant, and since they both make use of the same principle, namely, the *superheating* of the wax and its mold, the maintaining of this high temperature, and the subsequent positive application of cold to the exterior of the cylindrical mold and its contents. But, inasmuch as defendant discarded the use of the steam-jacketed mold many years ago, I am willing for the purpose of this cross-examination, to consider as "defendant's process" the carrying out of the principles just stated by means of the large vat and the mold without any steam jacket.

20

x-Q. 32. What are the difficulties to which you refer in your answer to Q. 5?

A. I assume you are inquiring about the "difficulties" named in the beginning of that answer. What I had in mind was the presence of air bubbles upon or against the matrix surface, which are liable to be entrapped there by melted wax. When this occurs, the resultant casting will present cavities upon its surface, which render the article practically worthless as a sound-record. I also had in mind, but to a less degree, the fact that there might be present in the casting certain impurities that would be either destroyed or driven off if the temperature of the wax, after it has been introduced

30

40



into the mold, should be raised materially, and maintained. This temperature-treatment will likewise eliminate the air bubbles referred to. I may add that I understand from conversation with those skilled in this art, and from the reading of the depositions of various experts connected with complainant, that another difficulty frequently encountered by beginners in the molding of duplicate sound-records, is the liability of the casting to chip or crack.

From the study of the testimony of various expert witnesses for complainants, and from my perusal of the decision by Judge PLATT, already referred to by me (135 F. R.), I understand that complainants remove these difficulties or overcome them by introducing their melted wax upward from the bottom of a mold that is either open-ended or has a large hole for the purpose; and that complainants have never made use of the process as described in the Joyce patent in suit. This confirms me in the statement I made in the beginning of my answer to Q. 5, namely, that Joyce had no idea of the difficulties to be met with; that is, because the Joyce process, as described in the Joyce patent, does not prevent or overcome these difficulties.

x-Q. 33. In the fifth paragraph of your answer I observe the following language: "The teaching of the (Joyce) patent is that the wax must not be superheated." Please point out any such teaching in this patent.

A. First, at the bottom of page 1, the patent says:

"The mold \* \* \* is heated, preferably, to near the temperature of melted wax."

As stated by me in answer to x-Q. 29-30, I understand this to mean that the mold is heated to a temperature preferably near (that is, about) the

melting-point of the particular wax composition to be employed. And I agree with Mr. Macdonald that this means a temperature a little *below* the temperature indicated.

Second, Claims 3, 4, and 6 in suit say that the "fused wax-like material" is at "substantially the same temperature as the mold." Now, as the mold is at about the temperature of the melting-point of the wax; and as the wax is at "substantially the same temperature," this must mean that the wax is at about (slightly over, I daresay), its melting-point.

In further corroboration of the first part of my answer I note, first, that the passage in line 103 of page 1 does not say "the temperature of *the* melted wax," which might, and possibly would, mean something different from what the patent actually says. But, since the patent gives not a syllable of statement as to raising the temperature of the wax substantially (or even to any degree) above its melting-point; since it merely says "the temperature of melted wax," the passage, either taken by itself or in connection with the entire Specification, can refer only to the melting-point of the wax. As an analogous expression, I would refer to *the temperature of melted ice*, which I think would be understood as meaning somewhere around 32°.

x-Q. 33. But are you not losing sight of the practical side of the matter. Suppose, then, that you were engaged in making sound-records by pouring "melted wax" into a hot mold, and subsequently cooling the mold, and thereafter removing the record. Remembering that Mr. Macdonald has testified (x-Q. 51) that "the melting point of this material is rather vague as it goes from a solid to a semi-plastic condition, gradually approaching a liquid condition through a molasses-like consistency," at



what temperature would you consider it proper and practical to maintain the wax in your kettle?

10 A. Frankly speaking, I do not believe the process that is set forth in the Joyce patent in suit has any practical side. And I am confirmed in my belief not only by the testimony given in this case by Mr. Macdonald, but also by the very persuasive fact that complainant does not employ the process set forth in the Joyce patent.

20 With regard to the statement you have quoted from Mr. Macdonald's testimony, I had in mind the fact that these wax compositions do not have a sharp, well defined melting-point as is the case with many definite chemical bodies; and therefore I used such expressions as "substantially" and "about" in referring to the "melting-point,"—meaning thereby a temperature at which the wax has *become* thoroughly molten or liquid.

30 If I should undertake to make cast duplicate sound-records, I should undoubtedly avail myself either of the principle of superheating as developed at defendant's factory, and would maintain the wax at a temperature of about 150° above the temperature at which the wax becomes liquid,—or perhaps I would avail myself of the manipulations, temperatures, etc. employed at complainants' factory, and would heat the wax to a temperature of about 20 to 40° above what the Miller & Aylsworth patent calls "*its melting-point*" (in line 23 of page 2), but I would in this case be particular not to *maintain* the mold within the vat more than the few minutes indicated, lest I should thereby re-melt the solidified wax that had accumulated upon the bore of my mold.

By Mr. DYKE:

40 This answer is objected to as not responsive to the question.

x-Q. 34. What I am trying to get at is this: If you were engaged in pouring melted wax into a hot mold (see line 104-106, page 1 of Joyce patent), would you attempt to pour it in its "molasses form"? Or would you heat the wax until it had become in a liquid condition which Mr. Macdonald has stated in his answer above referred to as being approached when the heating of the wax is continued.

10

A. In answering your previous question I answered as I did because the question did not seem limited to the "Joyce process." In view of your objection, I understand your question to be what I would do in attempting to carry out the process that is described in the Joyce patent in suit. I should certainly, in that case, not undertake to pour out the material while it was still in a viscous condition, but would wait until it was liquid, so that it could be readily poured. But neither would I undertake to heat the wax to a temperature far and away above a temperature sufficient for me to pour it. I observe that the Miller & Aylsworth patent in suit teaches us that the ordinary commercial record-composition now used, is sufficiently liquid to flow readily at a temperature only some 20° to 40° above its "melting-point." As compared with a temperature of 120° to 150° above its melting-point, a temperature of 20 to 40° is comparatively a slight increase. So far as I am at present aware, a temperature of 5 or 6 degrees above the mean or average temperature of the wax in its "molasses-like" consistency, would be sufficient to enable one to pour the wax.

20

30

x-Q. 35. You will admit, of course, that it would pour easier at a higher temperature than it would at a lower temperature than that which you have just indicated?

A. If by "pouring" you mean the operation of

40



10 discharging the contents of a pot or ladle into the mold, certainly a material that is liquid will pour easier than a material which is in a viscous condition. But so far as such operation of pouring is concerned, I do not believe that a wax composition at a temperature 150° above its "melting point" will "pour" out of a ladle into a mold any more readily than the same composition at only a few degrees above the temperature at which it has become thoroughly liquid throughout its entire mass.

20 I understand that there is no well defined sharply-indicated point at which a semi-viscous or viscous wax composition such as we are dealing with here becomes on the instant thoroughly and completely *liquid*. But, as soon as the material has become thoroughly liquid, additional heating from then on will not enable us to "pour" it any more readily.

30 It is also conceivable, and quite possible, that super-heating to a substantial degree may so affect the particles of the material as to increase its capacity for entering into the infinitesimally minute irregularities of the matrix surface. In short, it is conceivable and possible that super-heating as practiced by defendant may result in the production of a truer, and therefore a better, cast duplicate sound-record. But the Joyce patent in suit does not even hint at any such advantage, and therefore the Joyce patent does not (even indirectly) teach us to heat our wax substantially above the temperature at which it becomes melted.

Adjourned subject to notice.

NEW YORK, January 17, 1908.

Met pursuant to agreement at 2 p. m.

Present:

40 FRANK L. DYER, Esq., for complainants.

Cross-examination of the witness MASSIE continued:

x-Q. 36. Having reference to the numerous patents and publications referred to by you in your direct examination, do you find any one of them disclosing the suggestion of casting a cylindrical object in a continuous mold, and then after the material has set, and while it is still in the mold, in reaming out its interior, so that the mold serves the double function of defining the exterior surface of the object, and also of acting as a chuck for rigidly grasping the object during the reaming operation?

10

Objected to as immaterial.

A. I have not observed in any of the references cited by me any such description.

x-Q. 37. The statement contained in my last question is descriptive of operations that are common to the process disclosed in the Aylsworth & Miller patent No. 683,615, in suit, as well as to the process practiced by defendant, is it not?

20

A. That is not correct. In the first place, where your previous question speaks of "casting a cylindrical object in a continuous mold," I do not think these words are properly descriptive of the process disclosed in the Aylsworth & Miller patent inquired of. I mean by that, that if one were directed to carry out the casting process using fusible material and a cylindrical mold, I do not think it would occur to him to carry out the particular manipulations employed as described in the Aylsworth & Miller patent.

30

In the second place, it appears from the testimony given on January 3, 1908, by Mr. Macdonald, that defendant does not ream out the interior of its cast duplicates before removing them from their molds, but merely scrapes them out and subse-

40



quently performs the reaming operation after the duplicate has been removed from the mold.

However, regarded as a sweeping proposition, it is true in general terms that the Aylsworth & Miller patent describes the reaming out of the solidified deposit that you speak of as a casting, while the same is still held in its matrix; and that in defendant's process the interior of the casting is scraped out to produce concentric rings while it is still in its mold.

10 x-Q. 38. I understand, then, that in a broad or general sense, you do not make any distinction between the reaming operation suggested in the Miller & Aylsworth process patent, and the scraping operation performed by defendant, or in other words, you admit that in both instances while the solidified, hollow cylindrical object is still retained in the mold, an operation is performed on its interior by which excess material is removed, and concentric rings are formed?

20 A. In a broad and general sense, yes. The distinction I had in mind, in not answering absolutely and without any qualification is that the operation of the Aylsworth & Miller patent is the *complete* operation of "finishing;" whereas the operation performed in defendant's process, before removing the duplicate from its mold, is only preliminary, and is not the "finishing."

30 x-Q. 39. With the operation performed by defendant there is at least a preliminary finishing, is there not; that is to say, the record is finished so far as the space which exists between the rings is concerned, and also so far as the edges of the rings?

A. I will not commit myself as to whether or not it could be called a "preliminary finishing." But, as I understand the question, you are correct.

40 x-Q. 40. That is to say, the record is partially finished on its interior while still in the mold in defendant's process?

A. I am not prepared to consider anything as "partially finished," though I do not say that the idea is inconceivable. But certainly the interior of the record has been acted upon by an implement which, I understand, defines the spaces between what we have been calling the concentric rings,—and all this before removing the casting from its mold. The subsequent "finishing," I understand, consists of removing the circular faces of the rims, and in trimming the ends of the hollow cylindrical casting. 10

x-Q. 41. You do not pretend to assert, do you, that after the record is removed from the mold in defendant's process any operation is performed on the material which exists between the rings, or on the sides of the rings themselves other than their interior faces?

A. I do not. My answers were based upon Mr. Macdonald's answers to Q. 5 and to x-Qs. 47 and 48. But I think I should call attention to the stipulation given in the suits on the Miller & Aylsworth patents, where a statement is made that seems to indicate that all the operations of "finishing" except the cutting off of the ends of the casting are performed before the removal from the mold. 20

x-Q. 42. Are you able to state how much material is removed in defendant's process in trimming off the inner faces of the rings which are formed while the record is still in the mold? 30

A. I have seen the operation performed several times, but I did not observe particularly how much material was removed, and I could not undertake to answer your question off hand.

x-Q. 43. The purpose of this subsequent step is, as I understand it, to slightly trim off the rings so that they will fit the mandrel of the phonograph or graphophone, is this correct?

A. That is correct. 40



x-Q. 44. If the phonograph or graphophone were provided with a mandrel which would be fitted by the rings as formed in the record while still in the mold, you would admit, I suppose, that the subsequent operation of trimming off the rings would not be necessary?

10 A. If the duplicate as it exists in the mold before any reaming operation whatever should fit the mandrel of the machine, there would be no need for taking any further steps to make it fit. In the same way, if the "reaming" should produce a fit, there would be no need of further treatment to make a fit.

But it is quite conceivable that after the casting has stood for a day or so, removed from its mold, it may no longer fit accurately upon the mandrel of the machine, so that subsequent treatment would be necessary.

20 x-Q. 45. You have appeared as counsel and have examined and cross-examined experts in many patent suits, have you not?

A. Yes.

x-Q. 46. And I presume you have protested against the answering of questions in an involved way when they can be answered categorically, have you not?

30 A. I do not recall having made such objection except in cases where the witness has persistently given unresponsive and volunteered answers. I do not recall having protested merely on the ground that the witness's answer was not couched in short and concise language. I do recall very frequently that expert witnesses have declined to answer a categorical question, for the reason (given by them) that a categorical answer to the question as framed would not be the whole truth and would be misleading.

40 x-Q. 47. Have you any objection to answering

questions categorically when such an answer is appropriate?

A. I would prefer to do so, when in my opinion such answer is appropriate. But if, in my opinion, merely to answer categorically a question would not present the facts in what I believe to be the proper light, I shall endeavor to use sufficient words to make my belief plain.

x-Q. 48. Having reference to the doubt expressed by you in answer to x-Q. 44, you are aware of the fact, are you not, that in carrying out of the Miller & Aylsworth process by complainant the interior of the record is subjected to a single reaming operation? 10

A. I so understand the description given in the patents in suit.

x-Q. 49. Referring now to x-Q. 36, and assuming that the expression "casting a cylindrical object in a continuous mold" is comprehensive enough to include any process for forming or producing such an object either by introducing molten material over the top of the mold, or introducing molten material from the bottom of the mold, would the statement as so considered define an operation which is to be found in any of the numerous patents and publications referred to by you in your direct examination? 20

The question is objected to as immaterial.

30

A. It would not.

x-Q. 50. And such an operation as so defined would be descriptive of the operations described in the process patent in suit to Miller & Aylsworth, and in defendant's process, assuming that the reaming operation includes either a complete finishing of the interior of the record as well as a partial finishing thereof as practiced by defendant? ,

A. As thus broadly stated by you, and with the assumptions given, my answer is in the affirmative. 40



x-Q. 51. That is to say, aside from the question whether or not the Claims involved define it, there is a common generic statement of operation which applies both to the Miller & Aylsworth process and to the defendant's process?

10 A. Defendant carries out a process involving the employment of a hollow cylindrical mold and molten wax-like material, and the two patents in suit describe the use of such implements. Defendant obtains by these implements a duplicate sound-record, a casting; and the patents describe the production of a duplicate sound-record by the two implements named, which I am willing to call a casting. Defendant's process, and the description of the patents, involves the removal of the material from the interior of the casting while it is still within the mold and comparatively soft. In this sense I answer your question in the affirmative.

20 x-Q. 52. And in the same sense you admit that the operations as broadly set forth by you in the preceding answer, were, to the best of your knowledge, novel with Miller & Aylsworth?

A. To the best of my present knowledge the Miller & Aylsworth patents contain the first disclosure of utilizing the mold as a chuck for rotating the cast duplicate, so as to remove material from its interior before the casting has been withdrawn.

30 x-Q. 53. You are aware of the fact, are you not, that in the two suits which were tried before Judge PLATT on certain Edison patents, the alleged infringing operations of defendant involved the casting of a spiral rib on the interior of the record, and did not involve the performance of any operation on the bore of the record while the latter was still in the mold; and that the adoption by the defendant of its specific process, as now practiced by it, was subsequent to its commercial use of the process involved  
40 in those suits?

A. In examining the proofs in the Connecticut suits, I did not have that point in mind, but I think it quite likely that in December, 1901, and December, 1902 (the dates of filing those two suits), defendant was producing cast duplicates having a spiral rib formed by a core, and was not making use of an implement for removing the material from the bore (subsequent to the casting operation) in order to produce ribs.

10

If I am correct, it is also true that defendant adopted the specific form of process established in these cases subsequent to the use of the specific form of process established in the Connecticut cases.

x-Q. 54. Do you have any doubt as to the correctness of the statements given in my last question?

A. I do know that about 1901, defendant was making cast cylinder records having an internal spiral rib formed thereon by casting. I also know as a fact that defendant is now forming its internal ribs by removing the material with an implement, subsequent to the act of casting. But I do not know when the change was made. And I do not care to commit myself to the statement that this change was made subsequent to the taking of the proofs in the Connecticut cases. With this explanation I will say that I have no reason to doubt the correctness of your statement in x-Q. 53.

20

x-Q. 55. Is it your understanding of the present suits so far as the Miller & Aylsworth patents are concerned, that the complainant asserts any such interpretation of those patents as would include the first process practiced by defendant which was held by Judge PLATT not to infringe the Edison patents?

30

A. Your question seems to me to be somewhat "involved." It also seems to ask me as a witness to state what views of complainant's mental attitude are held by defendant's counsel. If you ask whether defendant regards complainants as attempting, by

40



the Miller & Aylsworth patents, to enjoin the precise identical method employed by defendant in carrying out its process which Judge PLATT passed upon, I would say that with respect to Claim 5 of the Aylsworth & Miller Apparatus patent at least, I do not find this Claim to contain any statement about reaming out the interior of the casting before removal from the matrix.

10 If by your question you mean to assert that the gist of the alleged infringement complained of in the present suits on the Aylsworth & Miller and Miller & Aylsworth patents consists of reaming the casting while still in the matrix, and in producing concentric rings instead of a spiral ring, I will say that with such assumption, and with my understanding of the particular methods employed by defendant, as made out in the Connecticut suits,—that  
20 the two Miller & Aylsworth suits are not intended to include the first specific form of process practiced by defendant, which was held by Judge PLATT not to infringe the Edison patents.

x-Q. 56. Regarding the fifth claim of the Aylsworth & Miller apparatus patent, you remember, don't you, that defendant's practice of casting the name of the record on the end simultaneously with the formation of the record surface, succeeded the process which was considered by Judge PLATT?

30 A. I do not. I have no idea when defendant first began to cast the name on the end of its cast records. It is quite possible, and for present purposes I will admit, that this feature has been introduced subsequent to Judge PLATT's decision. I am also satisfied that nothing, or at least very little, if anything, appeared in those Connecticut suits regarding this feature.

40 Having this feature—casting the name of selection—included as part of your x-Q. 55, and with the understanding just given, I will say that if the

casting of the name be regarded by complainant as the gist of the infringement complained of under Claim 5, that this idea was not involved in the suit before Judge PLATT.

x-Q. 57. Having reference now to the suit on the Joyce patent, and referring to the numerous examples given by you in which processes for making candles are described, what was the object in those processes of preheating the mold prior to the introduction of the molten material therein? 10

A. On page 266 of "Defendant's Exhibit, Soaps & Candles," I learn that the object of heating the mold and of subsequently applying cold water (the two together, as I understand it, forming the complete process), is to produce "a polished appearance" to the surface of the cylindrical casting.

From "Defendant's Exhibit, Field & Humfrey British Patent of 1856," I gather that the application of the cold water (which I have stated to form a part of the process of first heating the mold and subsequently, after filling, applying cold water), is to prevent the formation of crystals. 20

I also understand that a melted wax (or wax-like composition) when cast upon a hot metallic surface, will come into more intimate contact throughout the whole of such surface, than when cast upon a cold metallic surface. The foregoing statements contain my understanding of the particular purpose in view in the various references that deal specifically with the making of candles. 30

With regard to the references that disclose the manufacture of printers' rollers, I understand that the same reasons exist, and an additional one, namely, that such rollers are comparatively long, and the cylindrical molds are also comparatively long; that the flowing of the material into such long molds (and around a central core), would be inter- 40



ferred with if the mold and core be cold, because in the course of its flowing into the hollow space, the cold molds would chill the molten material and cause it to become viscous, if not actually solid. Hence the molds and cores are heated beforehand, in order that the entire mold may be completely filled with the liquid material.

10 x-Q. 58. One distinction that you point out between the Miller & Aylsworth process and defendant's process, is that with former the mold is dipped slowly and gently into the molten material, which is not necessary with defendant's process. Would defendant's process be altered if the mold were dipped slowly and gently into the molten material?

20 A. If the molds used by defendant were lowered, open-end upmost, into the vat containing superheated wax, this lowering being done in a very slow, gradual manner, it would not be what defendant is now doing. But I do not see any difference in principle, except that such slow immersion would be unnecessary, with defendant's apparatus.

x-Q. 59. By being the same in principle you mean the same for all practical purposes?

A. I think so.

30 x-Q. 60. Now if defendant's process be carried out in this way which you say is the same in principle as the process which it actually does perform, before the wax enters the mold the mold would be heated substantially to the temperature of the wax, would it not?

40 A. When I said that the two proceedings would be the same in principle, I did not mean to say that whereas defendant now fills a *cold* mold, *any* filling of a hot mold would be the same identical proceeding. Because we must not lose sight of the additional facts that not only must the mold in defendant's process be filled (whether hot, as suggested by

you, or *cold* as in actual practice by defendant), but the mold and the material must be super-heated and the super-heat maintained. So far as the mere *filling* is concerned, I will answer your question in the affirmative.

x-Q. 61. Limiting yourself to the art of making cylindrical phonograph records, do you find any disclosure in any of the patents and publications referred to in your direct examination of the process in which molten material is cast in a mold, the temperature of the latter being approximately the same as the temperature of the molten material?

A. To make my answer complete, I will refer, for example, to the Young British patent as discussed by Judge PLATT in the opinion reported in 135 Fed. Rep., to the effect that Young teaches us the use of a hot cylindrical mold having a reverse sound-record upon its bore, which it is true was described by Young for use with celluloid, but which could just as well have been used with a fusible material.

I also refer to the work done at defendant's factory as pointed out by Judge PLATT in the same opinion, which I understand is likewise described in certain exhibit depositions introduced into these cases by defendant.

It is the fact that so far as I am at present informed, I do not find any single patent or publication prior to the filing of the Joyce patent in suit that discloses the production of a cast sound-record by pouring molten wax-like material into a hot mold. But I should add that the Joyce patent in suit does not describe any such process that can be practically and commercially carried out.

Adjourned subject to notice.

New York, Jan. 20, 1908.

Re-direct examination, taken by consent of com-



plainant's counsel, in his absence, subject to his right to enter objections and to re-cross examine.

Re-direct examination.

Rd.Q. 62. In view of the objection entered after x-Q. 28, please state your authorities for saying you understand *beginning at least as early as the early*  
10 *'90's* phonogram blanks were made by casting, as already described by you?

A. When I first became associated with Mr. Mauro, in January, 1898, I soon learned, as a matter of general information, that the blank cylinders or phonogram blanks were formed by casting the melted wax-like material into hollow cylindrical molds provided with central cores; and that this method had been practiced both by the American Graphophone Co. and the Edison phonograph companies since the early '90's. This was not a special  
20 piece of information vouchsafed to me alone by one or two persons only, but was a matter of *general reputation*, well known to all persons connected with the talking-machine business.

Another source of my information is certain testimony for the New Jersey Patent Co. (one of the complainants herein) in a patent suit now pending in the Circuit Court of the United States for the District of New Jersey, in which the present defendant's selling agent is sued upon a certain patent  
30 to J. W. Aylsworth (who is joint patentee with Mr. Miller in two of the patents here in suit). In that Aylsworth suit in New Jersey, many witnesses on behalf of said complainant have testified to the effect that *in the early '90's* defendant, as well as the Edison companies, was making cast blank cylinders for sound-records, and in fact that the Edison companies began this operation even earlier.

40 In the Edison deposition (given Oct. 9, 1903, in

the Connecticut suit) in evidence herein, beginning at direct question 51, Mr. Edison testified that the molding of phonogram blanks began with the idea of making the blank entirely of one material, which was patented to him by U. S. Letters Patent No. 382,462. That patent is dated May 8, 1888.

In the same Connecticut suit (on Edison patent No. 713,209) Mr. Frank L. Dyer (who is complainants' counsel herein) appeared as expert for the complainant, and on June 25, 1903, in answering my cross-questioning, admitted in substance that "for the last ten years or more" phonogram blanks have been made by casting a molten material in a cylindrical mold and withdrawing the blanks after radial shrinkage. Mr. Dyer added that the mold was continuous (and not sectional), and that the castings were withdrawn from the blanks by direct longitudinal movement.

In Judge Platt's opinion in *135 Fed. Rep.*, so often referred to, I find many statements to the effect that this process of producing blanks had been practiced by both complainant and defendant for many years before the dates of filing the Edison patents there in suit.

Rd.Q. 63. I will ask you to compare the process of the Joyce Claims (involved in this suit) with that of the Claims of the Edison patent No. 713,209 declared on in the Connecticut suit before Judge PLATT, and incidentally with defendant's process?

A. The suit referred to was on Edison patent No. 713,209, granted Nov. 11, 1902; and the Claims declared on were Claims 2 and 3 thereof. On June 24, 1903, Mr. Frank L. Dyer, of counsel for complainants herein, having testified as an expert for the complainant therein, was cross-examined by myself. He was comparing the subject-matter of Claims 2 and 3 of said Edison patent then in suit, among other things, with the application for the



is applied to the set material before it has hardened is that of claim 5 of the patent. The language of claim 4 in specifying that the material is allowed to set is appropriate to indicate that one is to allow the material to become plastic and is, of course, appropriate to a process in which pressure is to be applied to the plastic material, but it is equally appropriate to a process in which some other mechanical operation is to be performed upon the plastic material.

x-Q. 51. What disclosure, if any, does the Joyce patent make with regard to any other mechanical process to be applied to the semi-plastic material except the mechanical pressure?

A. The patent states, p. 2, lines 44-46, "where I have indicated a 'wax' phonogram, it must be understood as applying to a phonogram of plastic material." This indicates to my mind that the inventor had in view the advantages of the use of a plastic substance, or one which passes through a state of plasticity during its cooling for the performing thereon of mechanical operations, since I cannot see that the property of plasticity is valued by the inventor for any other reason. The specific mechanical operation which the inventor describes as being performed upon the plastic material is that of mechanical pressure, and I do not find other mechanical operations described in the specification.

x-Q. 52. The patent describes two alternative processes: one in which mechanical pressure is applied, and the other in which mechanical pressure is not applied and no other mechanical treatment is set forth at a corresponding stage; the language of claim 4, where it names the two steps in the reduction of temperature, is appropriate to the former process, and is not appropriate to the latter process?

A. I would not say that the patent describes two alternative processes, but rather a single process, or rather two modifications of a single process, one in which a mechanical operation is performed upon a casting while it is plastic, and one in which this step is dispensed with, but which is otherwise the same. The language of claim 4 in my opinion is appropriate to the process which includes the performing of some mechanical treatment upon the material while plastic, but it seems to me that the expression "allowing the material to set," indicates or implies that one is to allow the material to become plastic, in order to perform some mechanical operation thereon, and for this reason I would not consider the language of claim 4 appropriate to a process in which there is no treatment of the plastic material as such.

x-Q. 53. Disregarding the mechanical treatment of pressure, reaming, or the like, applied to the plastic material as such, if we allow the cast composition to stand until it has become set, and then cool it by immersion in a water bath or similar means indicated in the patent, is the grain or texture or surface of the record in any respect better than if we simply introduced the molten material into the heated mold and permit the temperature to be reduced by a single continuous operation?

A. I have never experimented along this line and do not know.

x-Q. 54. Am I correct in understanding your direct testimony to mean that defendant's process is not identical, step for step, with the process of claim 3 in suit, but in your opinion the equivalent thereof?

A. I should say that the language of claim 3 is an exact description of the process practiced by defendant, that defendant's process comprises each of the three steps of the process claimed, in the



Joyce patent here sued on. I find on printed pages 38-9 of the Transcript of that suit, the following testimony by Mr. Dyer:

10 "Still another interference was declared between the application for the patent in suit [Edison 713,209] and an application of Maurice Joyce, who described the identical operations performed by defendant *except the single step of superheating the material*. In other words, Joyce made a matrix by covering a master with graphite and electroplating thereon, and he secured duplicates from such a matrix by *casting molten material* therein, and finally he removed the duplicate by radial shrinkage. The two processes [Joyce's and that of Edison 713,209] were regarded by the Patent Office as practically identical, and no question was ever raised by Joyce to the contrary, notwithstanding the fact that under the rules of the Patent Office ample opportunity is offered for dissolving interferences where no interference in fact exists."

(Italics and matter in brackets mine.)

20 Again, in answer to my x-Q. 27, Mr. Dyer said that Joyce—

"described the exact process used by defendant except the specific step of *superheating the material to eliminate air bubbles*." (Italics mine.)

30 The same Mr. Frank L. Dyer also testified as an expert witness for complainant in rebuttal in the same suit. On April 22, 1904, in answer to direct question 162, he discussed the Maurice Joyce application filed Oct. 13, 1897, and bearing the Serial No. 655,027,—being the application which eventuated into the Joyce patent here in suit. Mr. Dyer stated that on June 10, 1902, Joyce presented a claim corresponding with the second claim of the aforesaid Edison patent No. 713,209, then in suit.

40 Mr. Dyer noted that the Interference involved the

second and third claims of the Edison patent then in suit; and that the process of the said Edison Claims 2 and 3 was *not* limited to pressing a blank but included the casting with melted material; and that the Interference was decided in Edison's favor and against Joyce. In answer to x-Q. 129, Mr. Dyer said Joyce filed a concession of priority in favor of Edison.

Mr. Mauro has pointed out the result of the Connecticut litigation upon said Claims 2 and 3 of said Edison patent No. 713,209.

From the foregoing examination it will be observed: *First*, that Claims 2 and 3 of the said Edison patent No. 713,209, cannot be enforced against this defendant. *Second*, that Joyce is not entitled to assert any claim superior to, or commensurate with, said Edison Claims 2 and 3. *Third*, the process set forth by the Joyce Claims in suit, differs from the process set forth in said Edison Claims 2 and 3 *solely* by reason of the *heating* of the Joyce mold, which I have already quoted Mr. Dyer, as meaning "*preheating*" (in my answer to Q. 9). And, *Fourth*, that defendant's process (both then and now) differs from the process set forth by Joyce in that Joyce *pre-heats* and does *not super-heat*, while defendant does *not pre-heat* and *does super-heat*. I may add, as *Fifth*, that the two differ essentially in that defendant's process is operative and highly successful, while the Joyce "process" is *inoperative* and *unsuccessful*, and has not gone into use.

In short, to sum up, we may assume the process set forth in Claims 2 and 3 of the said Edison patent No. 713,209 as the *basis* or "*starting-point*," from which to reckon. Defendant's process was adjudged by Judge PLATT to differ therefrom, because (among other things) of the super-heating,

10

20

30

40



which is still the characteristic feature of defendant's process; while the Joyce process differs therefrom by *pre*-heating but *not* super-heating. That is, defendant departs from the "common starting-point" in *one* direction, while the Joyce process departs therefrom in *another* and *different* respect.

10 Rd-Q. 64. Please compare the production, by means of the hollow cylindrical record-mold, of duplicate sound-records, by (a) pouring into the mold a *melted* composition of *wax-like* material, or (b) by inserting into the mold a hollow cylinder of the same material in a comparatively *solid* consistency, and heating the same (without melting) and applying pressure, or (c) by inserting a *celluloid* shell into the mold and heating and expanding the same, in view of the same Mr. Dyer's testimony in said Connecticut suit?

20 A. In the said deposition, in answer to my x-Q. 23, Mr. Dyer stated that the Edison application (for the said Edison patent No. 713,209) was placed in Interference with a certain Lambert patent; subsequently with a certain Capps application; and still later on with the Joyce application (now the Joyce patent in suit).

Regarding the Lambert patent Mr. Dyer said:

30 "The matrix was formed exactly like those of defendant by coating an original master with graphite and electroplating thereon, and . . . celluloid duplicates were secured from such a matrix by first [inserting a celluloid tube into the matrix and then] softening a [the] celluloid tube with a solvent and expanding the same by steam pressure." (Matter in brackets mine.) And that all the tribunals of the Patent Office refused to dissolve  
40 this Interference (involving, as it did, Lam-

bert's *celluloid scheme* and Edison's use of a solid *wax-composition*.

The Capps process, Mr. Dyer testified, employed a celluloid tube in a matrix, and the celluloid was expanded by the evaporation of a solid, and the Capps Interference was not dissolved.

In the Joyce process, as we know, the molten or liquid wax was poured into the cylindrical matrix.

In answer to x-Q. 23 Mr. Dyer showed that the Joyce process of pouring the melted material into the mold was regarded by the Patent Office, by Mr. Joyce, by Mr. Edison, and by himself "*as patentably identical*" with the Edison process of inserting a "blank or cylinder, in a relatively *solid state*."

In answer to x-Q. 27 Mr. Dyer testified that the Patent Office decided that the Edison process of warming the solid blank (and pressing it while plastic but still solid) was "patentably allied" with a casting process like Joyce's.

After Mr. Dyer had admitted that where the Edison patent No. 713,209 speaks of "impressing" upon "blanks" it meant specifically *pressing* the wax-like cylinder existing in a comparatively *solid state* (as distinguished from being liquid or molten) against the matrix,—in x-Q. 29 he said this language of the Edison patent was likewise applicable to the Joyce process where the composition was *melted* and poured into the mold; and that the Patent Office had sustained this view.

I will quote my cross question 50, put to Mr. Dyer:

"50 x-Q. You have stated on more than one occasion that the process, or rather step, of melting the record material and pouring it into the mold while in a liquid state so as to form the phonogram by casting, is the equivalent of



those steps of the preferred process [of the Edison patent No. 713,209] which consist of taking an ordinary blank and inserting it in the mold and subsequently expanding it by heat or pressure or both. What is your authority for this statement? I understand that the [Edison] patent in suit makes no such disclosure in its terms." (Matter in brackets mine).

10

Mr. Dyer's answer begins:

20

"If I were not capable of forming an independent judgment on this question, I should say that my authority was the expert's in the Patent Office, who declared an interference between Edison and Joyce and thereby held that one process was the equivalent of the other. I do not, however, need any special authority for the support of my opinion other than ordinary familiarity with mechanical matters in general \* \* \* "

And Mr. Dyer proceeds to give his reasons very clearly, saying that if the two operations inquired of should be more closely allied than they were, "they would be mechanically identical."

30

In answer to x-Q. 51 Mr. Dyer admitted that generally speaking he should say that when Edison—by the Edison patent No. 713,209, which Mr. Joyce has admitted to be an anticipation of his own (Joyce's) invention, and which the Court has held not infringed by defendant—had once disclosed to the public his process of making duplicates by means of inserting a blank and expanding the same (while yet of a comparatively *solid* consistency) by mechanical pressure, then,—“the possibility of *casting* them would be obvious”; especially, as Mr. Dyer pointed out in answer to x-Q. 52, since the casting of  
40 duplicates was known to the public through the

medium of Edison's prior patent No. 484,582 (the "split mold patent").

Again, the said Edison patent No. 713,209, (there in suit) enumerated as the material of the duplicate "phonogram" not only the ordinary wax-like compositions but also *celluloid* and similar materials. And in answer to my x-Qs. 76-77-78, Mr. Dyer admitted that celluloid was "plastic" for the purpose of taking impressions from the mold and that his term "plastic" correctly described and included the ordinary wax-like cylinder-composition as well as celluloid and similar substances, with which the process of said Edison patent might be carried out.

From the foregoing review of Mr. Dyer's expert testimony, it will be perceived, *First*, that Mr. Joyce, Mr. Edison, Mr. Dyer, and the Patent Office believed and asserted that the formation of *cast duplicates* by pouring a *liquid* wax-like composition into the mold, was the mechanical equivalent of forming a duplicate by expanding within the mold a warm yet *solid* hollow cylinder of the same composition, and that the former was obvious after the latter became known. Briefly, *pressing* with *solid* wax is equivalent to *casting* with *melted* wax.

*Second*, that complainant's counsel and expert (Mr. Dyer) and the Patent Office agree that the formation of *celluloid* duplicates, by inserting a hollow shell of celluloid into the matrix and then heating and expanding it by pressure, is the mechanical equivalent of the above *pressing* process of the Edison patent. Briefly, *pressing* with *solid* wax is equivalent to *pressing* with *softened celluloid*.

And, *Third*, since "things equal to the same thing are equal to each other," that *pressing* with *softened celluloid*, is equivalent to *casting* with *melted* wax.

Rd-Q. 65. Please apply the information you



have gathered from Mr. Dyer's deposition, to the process of the Young British Patent; and compare the same with the process of the Joyce Claims in suit?

10 A. The Young British Patent discloses the same hollow cylindrical record mold that Joyce describes. Young directs the *preheating* of this mold, and so does Joyce. Young then directs the insertion of  
20 the celluloid shell, and makes use of the heat already imparted to the mold for heating and softening the celluloid; whereas Joyce makes use of what is the "mechanical equivalent," namely: the pouring into the same heated mold of the melted composition. Finally, Young directs the collapsing of his *celluloid* duplicate in order to withdraw it; whereas Joyce avails himself of the greater shrinkage of the composition *he* is dealing with, in order to withdraw the casting,—which (as Judge PLATT has already adjudicated) is an *obvious* expedient with such materials.

In short, the process of the Joyce Claims in suit is substantially the same as that of Young; because it differs therefrom solely by employing what complainant's counsel has admitted to be a mechanical equivalent, resulting in what Judge PLATT calls an obvious modification of a subsequent manipulation.

30 Rd-Q. 66. Referring to x-Qs. 36 and 49, I will ask if you find any Claim here in suit that covers the idea of utilizing the mold not only for outlining the exterior of the casting, but also as a chuck? And also do you find any Claim here in suit that covers the idea of reaming out the interior of the duplicate of sound-record before the latter has ever been removed from its mold. And, finally, do you find any Claim here in suit that covers the production of concentric ribs upon the interior of the sound-record, whether by reaming or otherwise?

40 A. I do not. There is no such Claim in suit.

Of course some of the Claims include one or more of the ideas inquired of, but along with other features *not employed by defendant*. In answering this question it is not necessary to refer to the Joyce patent, which makes no mention of reaming out the interior. In the Miller & Aylsworth process patent, Claims 3 and 4 recite, as one of the steps of the process, the "finishing the bore of the duplicate"; and thereafter recites, as a subsequent step, "separating the duplicate from the matrix." Thus only by implication is the idea inquired of in your question to be found in these two Claims. But as pointed out in my direct examination, these Claims, 3 and 4, recite *three* steps as constituting the process; and since defendant does not employ the first step, defendant does not employ the process of Claims 3 and 4.

The same remarks apply to Claim 5 of the Miller & Aylsworth process patent, except that this Claim expressly directs us to finish the bore of the duplicate "before the latter has become hard." So far as this specific recital is concerned, I find the same idea in the Edison patents No. 393,462 and No. 393,463, already made exhibits herein, viz., that the phonogram blank is to be *heated* so as to make it comparatively *soft* for the action of the reaming tool.

Of the Aylsworth & Miller apparatus patent, Claim 5 contains no mention of reaming or the use of the chuck. But Claims 6 and 7 do recite, but as *one* element of an alleged "combination" of two elements, means for reaming the interior of the duplicate while the latter is still held by the mold, Claim 7 specifying that the means employed will produce the concentric ribs. But since these two Claims call for an alleged "combination," and since defendant (for reasons pointed out in my direct examination) does not employ the first one of the two ele-



ments of the alleged combination of Claims 6 and 7, defendant does not employ the alleged "combination" in its entirety.

10 To make my answer to your question more positive, I say that, for the reasons just pointed out, the particular feature or idea which was inquired of in x-Qs. 36 and 49, and which feature or idea complainants' counsel seems to have settled upon as being one of the two features or ideas that are  
20 common to the defendant's process and apparatus on the one hand and those of the Miller & Aylsworth and Aylsworth & Miller patents on the other hand, are *not* claimed in either of the said patents; they are merely implied in some Claims, and included in others as elements of an alleged "combination."

Rd-Q. 67. What have you to say regarding the  
20 *novelty* or *obviousness* of reaming out the interior of the casting before it has been removed from its mold?

A. I will recall first that the reaming out of the interior of phonogram blanks was old and well-known, and has been described in various early Edison patents. Second, the production of a phonogram blank having an internal spiral rib formed  
30 *by casting* is the specific disclosure of the Edison patent No. 414,761; but the same Edison patent likewise discloses internal ribs *in general*, which I understand to include *concentric* ribs, which (for the reasons pointed out) could only be made by *reaming*, and could not be made by casting. Therefore, in view of the Edison patent No. 414,761, there could be no novelty or ingenuity required in producing a phonogram cylinder having internal *concentric* ribs formed by *reaming*.

In the third place, if one wishes to produce internal concentric ribs, he *must* do so by reaming; and he would *preferably* do so while his material is comparatively soft. And this last idea is fully disclosed  
40

in the two Edison patents No. 393,462 and No. 393,463 referred to.

The proposition, then, comes down to something like this: We have before us a cast cylindrical sound-record within whose bore we desire to produce concentric ribs (an old feature) by *reaming* (the only conceivable method); and we have already been taught that the material should be warm and comparatively soft for satisfactory reaming. Now, then, shall we wait until this casting becomes cold, and then *re-heat* it to ream it out; or shall we take advantage of its present warm and comparatively soft condition, and ream it immediately?

In my opinion there is only one answer to this: It would be perfectly obvious to any *intelligent* mechanic that he could at once, as soon as his casting had become "set," and while it is still comparatively soft, and before waiting until he had *chilled* it down so as to remove it from his mold,—I say, that it would be perfectly obvious to him that he could at once proceed to ream out its interior. And I believe that all persons having in mind the state of the art as above set forth by me, will agree with this view.

I would refer here to what I understand to be the regular practice in all well regulated kitchens, namely, that the pots and pans that have been used are cleaned out at once, while the utensils themselves and the grease, etc., are still warm and the latter comparatively soft and easy to remove. I do not think any one would regard it as a patentable invention in some cooking-school expert who undertook to teach us that we must clean out our pots and pans while they are still warm and the contents still soft, instead of waiting until all had gotten cold.

In fine, so long as spiral ribs were desired, they



could be made (and were made) during the process of casting the cylinder. As soon as *concentric* ribs were desired, as they could *not* be produced by casting, they would have to be produced by reaming,—and such reaming would *naturally* be performed while the material of the casting is still warm, and still in the mold.

10      Rd-Q. 68. Do you find in the prior art, and particularly in the talking-machine art, any disclosure of the production of a duplicate by means of a hollow cylindrical record-matrix, and the subsequent application of mechanical treatment to the interior of such article, while the latter is yet warm and before it has been removed from its mold or matrix?

20      A. The aforesaid Edison patent No. 713,209, describes, and in Fig. 2 illustrates, the production of a duplicate sound-record B, by means of the record matrix A. While B is still within A, and is warm and comparatively soft, the mandrel C is employed for shaping the interior of the duplicate B. This Edison application was filed March 5, 1898.

30      In "Defendant's Exhibit, Lioret Patent No. 528,273" (granted Oct. 30, 1894), among other things, I note—referring, for instance, to Fig. 8—that the duplicate sound-record *c*, has been produced within the cylindrical record-surface *a1*, and that, while the duplicate *c* is still warm, and comparatively soft, and is still retained within its matrix, the tapered mandrel *a2* is forced downward to shape the interior bore of the duplicate record.

40      I also refer to Lambert patent No. 645,920, granted March 20, 1900 (which, by the way, is the patent whose application was in interference with the Edison application for the Edison patent No. 713,209, as stated in my examination of Mr. Dyer's former testimony). In this patent the duplicate sound-record is formed within a cylindrical electroplate matrix, and while still held within its matrix, and still

comparatively soft, pressure is applied to the interior of the said duplicate sound-records.

I likewise refer to the Joyce patent here in suit. Joyce's cast duplicate L is formed within his continuous cylindrical mold H, and while still warm, comparatively solid, and not yet withdrawn from the matrix, its interior is acted upon by the tapering core.

Rd-Q. 69. Referring to x-Qs. 55 and 56, do you find any Claim in suit that covers the feature of those questions?

A. I do not. Claim 5 of the Aylsworth & Miller Apparatus Patent is the only Claim in suit that mentions or refers to the idea of casting the name of the particular selection simultaneously with the formation of the casting. And Claim 5 recites this only as one element—and a *secondary* element at that—in a combination comprising *three* other elements, none of which defendant uses. And, since defendant does not use the three principal elements of this Claim 5, defendant does not use the "combination" recited by the Claim.

Considering this Claim 5 together with my previous answer, it is the fact that the only two features or ideas that complainants' counsel has pointed out as common to defendant's process and apparatus on the one hand, and those of the two Miller & Aylsworth patents on the other,—are features for which neither patent has any Claim.

Rd-Q. 70. What can you say as to the novelty of this feature of casting the name simultaneously with forming the duplicate?

A. It is absolutely without novelty, for the reasons stated in my answer to Q. 20. In making *metal* castings, it has for years been the common practice to cast thereon, simultaneously, the name of the maker, patent-markings, etc.



Rd-Q. 71. Compare the process claimed by the Joyce patent in suit with the process as carried out by defendant and the modification of defendant's process suggested by complainants' counsel in x-Qs. 58-60, namely, that the mold be inserted slowly.

10 A. Defendant's actual practice submerges the cold mold, in a *hap-hazard* fashion, into the *superheated* material. The first result of this is merely to fill the mold, but it is filled with *superheated* material; and the next result is not only to heat the mold but to heat it to a temperature far above the melting-point of the wax. And, finally, this temperature is maintained for some minutes, and air-bubbles, etc., eliminated.

20 The modification suggested by complainants' counsel—the only change being to lower the mold gradually and slowly—would result in having the mold heated before any of the melted wax enters the mold. So that the first result is to fill a *heated* mold, but it would be filled with *superheated* material; and as the next result there follows, just as in the practice actually carried out by defendant, the heating of the mold to a temperature far above the melting-point of the material, and the elimination of air-bubbles.

30 According to the Joyce "process," the mold is preheated to a temperature very nearly that of the *melting-point* of the wax, so that the first result of pouring the melted wax, which is at very little above its melting-point, is to fill a heated mold. But it is *not* filled with *superheated* material. Consequently, there is no superheating of the mold. Superheating, as so often pointed out, is one of the things that distinguishes this process from the Joyce patent. I again call attention to Mr. F. L. Dyer's former testimony, which I have quoted, namely: That the Joyce "process" differs from defendant's in *not* superheating. Also, there is no

40

direction by Joyce to *maintain* the heat. Consequently air-bubbles are *not* eliminated by Joyce.

To sum up: If defendant's process be modified as suggested, so as to be specifically *different* from the practice as actually carried out by defendant, the modified process would still differ from the Joyce process in the two essential respects in which defendant's actual process differs from the Joyce process. Joyce departs from what I have spoken of as "the common basis" (of the process of Claims 2 and 3 of the Edison patent No. 713,209) in *pre*-heating his mold, although Joyce does *not* super-heat it. Defendant's actual process and the modification suggested by complainants' counsel, both of them, depart from the aforesaid "common basis" (of Edison) by superheating, and by *maintaining* the heat.

Defendant's counsel offers in evidence Edison patent No. 713,209, dated Nov. 11, 1902, as "Defendant's Exhibit, Edison Patent No. 713,209."

Defendant's counsel has already marked for identification the transcript of record and exhibits in the Connecticut suit, and especially calls attention to the Dyer deposition therein, referred to by the witness Massie.

No re-cross examination.

Signature of witness and certificate of magistrate waived.

Defendant closes its proofs in each of the three cases.



## COMPLAINANT'S REBUTTAL PROOFS.

## IN THE UNITED STATES CIRCUIT COURT.

## Southern District of West Virginia.

10	NATIONAL PHONOGRAPH CO.,	} In Equity, on Miller & Aylsworth Patent No. 683,615.
	vs.	
	AMERICAN GRAPHOPHONE CO.	
	NATIONAL PHONOGRAPH CO.,	} In Equity, on Ayls- worth & Miller Patent No. 683,676.
	vs.	
	AMERICAN GRAPHOPHONE CO.	
20	NEW JERSEY PATENT CO.,	} In Equity, on Joyce Patent No. 831,668.
	vs.	
	AMERICAN GRAPHOPHONE CO.	

Further testimony in Rebuttal taken pursuant to  
notice at the office of Frank L. Dyer, Orange, New  
Jersey, March 4, 1908, at 11 A. M., before Alphons  
Westee, Notary Public of New Jersey, Special Ex-  
aminer by consent.

## Present:

FRANK L. DYER, Esq., and HERBERT H. DYKE,  
on behalf of complainants.

C. A. L. MASSIE, Esq., on behalf of defendant.

## DEPOSITION OF MARTIN SHANNON.

MARTIN SHANNON, a witness produced on be-  
half of complainants, being duly sworn, deposes and

says in answer to question propounded by Mr. Dyke, as follows:

Q. 1. Please state your name, age, residence, and occupation?

A. Martin Shannon; age, 40; reside 17 Babcock Place, West Orange, N. J.; occupation, foreman of Master Molding Department of the National Phonograph Company.

10

By Mr. Massie:

The informal notice over the telephone and the letter which we accepted in lieu of the formal notice named Mr. Browne, the expert, as the witness to be examined. Defendant's counsel will waive any objection to the examination of this witness or any other witness produced other than Mr. Browne provided that if further time be desired by defendant for cross-examining such witnesses, the same will be granted by complainants.

20

By Mr. Dyke:

Complainants' counsel will, of course, give such reasonable time as may be necessary for purposes of cross-examination, granting to defendant's counsel the same right he would have if advised of the taking of the present testimony by formal notice. Counsel for complainants states that it was his purpose to proceed this morning with the examination of Mr. Browne, but as Mr. Browne is not present and Mr. Massie is, the taking of the present testimony was regarded as an accommodation to defendant's counsel.

30

Q. 2. Mr. Shannon, what is the work on which you are engaged as foreman of the Master Molding Department?

40



A. I have charge of the making of the master molds. While I don't have charge of making the molds, I make the masters from the mold.

Q. 3. Please explain how these masters are made from the master molds in your department?

A. I produce three metal parts. This is the core (indicating) ; it is first heated, after it is hot enough the mold (the second of the parts produced) is placed upon the core, and the cap (the third piece referred to) is placed on top of the mold, then the three pieces are set in a gas furnace and heated until it is hot enough so that it will simmer by touch of a wet finger applied to the exterior of the mold. These parts are then taken out of the oven by a wire hook inserted through the opening in the top of the core, then placed on a table and now filled with wax, the temperature of which is 375° F. The wax is poured in with a coffee pot or other vessel having a spout. The filled mold is then taken and chilled by setting it in a tank containing water; the water comes up close to the joint between the mold and the cap. It remains in the water until the wax has congealed so it is safe to take out without the wax running. It is then placed, still upright, in a revolvable chuck. The base is secured in this chuck by means of a thumb screw. Then the cap is first scraped on the inside with a thin knife which loosens the wax from the cap. Then the cap is taken off, which leaves the wax projecting from the top of the mold and around the top of the core, it (the wax) is then cut off square with the top of the mold by means of a knife, the chuck being rotated during this operation. Then the mold is taken right off of the core, a slight twist may be given. The casting leaves the core and comes up with the mold. Then the mold with the casting therein is placed on a reaming machine, and the inside reamed to a taper; the mold still containing the casting is placed upon a hollow metal shell

which fits the interior of the casting; a water jacket is set upon the outside of the mold, encircling it, and cold water is circulated through the jacket, until the master leaves the mold. The mold is then lifted up, leaving the record on the shell and the record remains there until it is cold. This might be from a half hour to an hour and a half. I have referred to the record in this answer sometimes as the casting and sometimes as the master.

10

Q. 4. How long have you been foreman of the Master Molding Department?

A. I can't tell exactly, it will be, I believe, sometime in last August I took charge of it, but I worked on it previous to having charge of it.

Q. 5. How long have you been engaged in this work in any capacity?

A. Three years or over.

Q. 6. How long, if you know, has the method which you have described of making molded masters been in use in the department of which you are now foreman?

20

A. Three years or over.

Direct examination closed.

By Mr. Massie:

x-Q. 7. What is a master record, that is, what is it used for?

A. It is used to make molds from.

x-Q. 8. I understand the practice of the National Phonograph Company is first an original sound-record is made upon the phonograph, as by a band playing or a singer singing a song; then a mold is made from that original record; then your master records are cast from that first mold; and then further molds are produced upon those master records; and finally your commercial sound-records are made from those second molds. Is that correct?

30

A. Yes.

x-Q. 9. Have you any idea of the temperature to 40



which the molds are raised in the gas oven?

A. No, I have not.

x-Q. 10. I understand that you use the wet finger test and do not employ a thermometer.

A. Yes, sir.

x-Q. 11. How many persons are engaged in the master molding work?

A. Eight, seven beside myself.

10 x-Q. 12. How many of these handle the heating of the mold?

A. Two.

x-Q. 13. Is the wax you employ in making the master records the same that is used for making the commercial records you put on sale?

A. I couldn't say.

x-Q. 14. Do you know what the material is that you call wax?

A. No.

20 x-Q. 15. Do you, in the conduct of your department, have to make requisitions from time to time for this wax; or does some other department keep you supplied without any request coming from you?

A. I send a man after it.

x-Q. 16. What do you instruct this man to ask for, and if you know, what does he ask for?

A. Master wax.

30 x-Q. 17. And I understand that you do not know what this wax is?

A. No, sir.

x-Q. 18. Are you at all familiar with the appearance of the wax of the ordinary Edison molded records on the market?

A. No, I am not, I never take much notice of it.

x-Q. 19. So far as the mere looks go, what differences, if any, are there between the master record made in your department, and the ordinary Edison molded record on the market?

40 A. That I don't know, they are a larger record.

The master record is a larger record than the regular. I mean that the outside is the same, but the master record has a thicker wall and it has a smooth tapered bore, there is more wax in it than in the regular record.

x-Q. 20. I do not care now about the size or shape of the two articles, but would like to know about the appearance of the wax of which they are made. Is there any difference so far as you know, in the wax of a master record and the wax of a regular Edison record? 10

A. Not that I know of.

x-Q. 21. I suppose that the temperature to which the master wax is raised, namely 375° F., is not measured by a thermometer every time you pour wax, but that thermometer readings are taken from time to time, so as to guide you in the general run of your operations?

A. Yes, that is right. 20

x-Q. 22. Do you know about at what temperature the master wax melts?

A. It will melt at 180°-190°, or probably less than that.

x-Q. 23. Is there any regular practice in your department with regard to the number of masters you make from any particular mold; or do you have to get particular instructions in regard to each.

A. I have an order to go by. 30

x-Q. 24. After you have placed your mold containing the casting within the water, and when the cooling has proceeded so far that the master shrinks away from the mold, exactly how do you remove the mold from the master?

A. We raise the molds straight up.

By Mr. Dyke:

The mold referred to by the witness, comprising the three detachable parts described, is 40



introduced in evidence and marked "Complainant's Exhibit Commercial Joyce Apparatus."

By Mr. Massie:

10       The exhibit is objected to as irrelevant and immaterial and the designation given it is objected to as misleading, since the same does not appear to be a "commercial" mold, but a mold for master records, and no basis is laid for using in connection with it the name "Joyce."

STIPULATION.

20       It is stipulated and agreed between counsel that unless otherwise requested in particular cases, every exhibit introduced may remain in possession of counsel introducing it, subject to production upon reasonable request.

Signature and certificate waived.

March 5, 1908.

The witness MARTIN SHANNON, on behalf of complainants, is recalled.

Rd-Q. 25. Mr. Shannon, when you were testifying yesterday, Mr. Massie asked you the following question:

30       x-Q. 22. "Do you know at about what temperature the master wax melts?"

and you replied to that question:

"It will melt at 180°-190°, or probably less than that."

do you wish to make any correction to that answer?

A. It was 290° that I meant. It will stay at a melted liquid at 290°.

Re-cross examination by Mr. Massie:

40       Rx-Q. 26. Who called your attention to the fact

that you had made the mistake of saying 180°-190°?

A. That gentleman over here (indicating Mr. Dyke).

Rx-Q. 27. Were you surprised that you had made the mistake, or were you under the impression that your first answer was correct?

A. I supposed it was 290° that I said, instead of 190°.

Rx-Q. 28. Have you, since you gave your testimony yesterday, made any thermometer readings of the temperature at which this wax becomes liquid? 10

A. None but with my regular wax as I work daily.

Rx-Q. 29. Have you, either yesterday or today, observed by the thermometer the temperature at which your regular wax becomes liquid?

A. Nothing but merely in the kettle that I used.

x-Q. 30. Is that a fact that neither yesterday or today, in the kettle that you used, you have taken a thermometer reading to find out about what temperature your wax first becomes liquid? 20

A. No, sir.

x-Q. 31. Have you, either yesterday or today, found out by a thermometer the temperature at which you wax becomes solid?

A. No, sir.

Rx-Q. 32. When Mr. Dyke, here present, spoke to you about the mistake in your answer, did you not suggest that you should inquire of Mr. Dodd as to the temperature? 30

A. Yes, sir.

Rx-Q. 33. Why was this, did you not think you knew it yourself already?

A. Well, the way I understood, or the way the question was put by you, what the heat would it take to melt solid wax.

Rx-Q. 34. What is the heat that will take to melt the solid wax? 40



A. I could not say.

Rx-Q. 35. When I asked you yesterday, do you know about at what temperature the master wax melts, you thought I was asking how much heat it would take to melt solid wax?

A. Yes, sir.

10 Rx-Q. 36. And that is the question you undertook to answer yesterday?

A. Yes, sir.

Rx-Q. 37. And as a matter of fact you cannot say how much heat it will take?

A. To melt solid wax? I don't know anything about it.

Rx-Q. 38. What do you mean by solid wax?

A. Why, cake wax.

20 Rx-Q. 39. You mean the same wax that you use in molding masters, except that it is not broken up into small lumps, but is in a solid cake?

A. Well you must break it up in lumps to melt it; it is all solid wax.

Rx-Q. 40. If you have a batch of your master wax, at the temperature at which you use it in filling your molds and then let it cool, will it be liquid when it is cooled down to 280° F?

A. I couldn't tell you.

Rx-Q. 41. Would this melted wax become solid when it got down to 300° F?

30 A. Which, on the thermometer? (Yes.) No, it would not be solid, it would be melted.

Rx-Q. 42. I mean, you have some of your master wax heated way up to, say 375° F.; you then let it stand or cool it until its temperature is 300° F.; will it then be solid or liquid?

A. Liquid.

Rx-Q. 43. But as to 280° you cannot say?

A. No, sir.

Re-direct by Mr. Dyke:

40 Rd-Q. 44. Mr. Shannon, when I had you come

over here this morning, did I not tell you that you had testified yesterday that the master wax melts at 180° to 190°, and ask you if that statement was correct?

Objected to as leading.

A. Yes, sir.

Rd-Q. 45. And when you stated you would see Mr. Dodd about it, did I not instruct you to go and find out for yourself? 10

A. Yes, sir.

Rd-Q. 46. Did I not instruct you to go and find out for yourself?

A. Yes.

Rd-Q. 47. But you did not do so?

A. No, because I knew 290° was right.

Rd-Q. 48. How do you melt your wax?

A. Melt it with a gas fire. 20

Rd-Q. 49. Do you fill the vessel with cold wax and then apply heat and melt this wax?

A. Yes, sir, it has to be done that way.

Rd-Q. 50. When you do so, at what temperature does it melt?

A. At 290° it will melt, the wax will stay at liquid at 290° on the thermometer.

Rd-Q. 51. You have, yourself, melted wax in this way, and taken its melting temperature with a thermometer? 30

A. Yes, sir, but not very many times; it is always prepared for us by the watchman.

Rd-Q. 52. When you did melt the wax in this way, what the thermometer reading when it melted?

A. At 290° the most of it is melted, but there may be some hard lumps in it.

Rd-Q. 53. Is it your usual custom to melt your master wax without any previously melted wax in the kettle?

A. We clean it out once a week and start with 40



fresh cold stuff, the rest of the time we add fresh wax in lumps to that already melted in the tank.

Adjourned until March 6, at 10 A. M.

10

20

30

40

IN THE CIRCUIT COURT OF THE UNITED  
STATES.

Southern District of West Va.

NATIONAL PHONOGRAPH CO.	In Equity, on Miller & Aylsworth Patent No. 683,615.	10
vs.		
AMERICAN GRAPHOPHONE CO.		
NATIONAL PHONOGRAPH CO.	In Equity, on Aylsworth & Miller Patent No. 683,676.	
vs.		
AMERICAN GRAPHOPHONE CO.		
NEW JERSEY PATENT CO.	In Equity, on Joyce Patent No. 831,668.	20
vs.		
AMERICAN GRAPHOPHONE CO.		

Complainant's Testimony in Rebuttal taken pursuant to notice at the office of A. M. and E. H. Parkins, Room 516, Washington Loan & Trust Building, Washington, D. C., on Monday, February 24, 1908, at 11 A. M., before A. M. Parkins, Notary Public in and for the District of Columbia, and Special Examiner by consent of counsel. 30

Present:

HERBERT H. DYKE, on behalf of complainant.

S. T. CAMERON, on behalf of defendant.

DEPOSITION OF MAURICE JOYCE.

MAURICE JOYCE, a witness produced on behalf of complainants, being first duly sworn, deposes and says in answer to interrogatories by Mr. Dyke, as follows, to wit: 40



Question 1. Please state your name, age, residence, and occupation?

A. Maurice Joyce; age, 70 years; occupation, photo-engraver; residence, 922 M Street, N. W., Washington, D. C.

Q. 2. Are you the same Maurice Joyce to whom United States Patent No. 831,668, for Method of Duplicating Phonograms, was granted on Sept. 25, 1906, upon an application filed Oct. 13, 1897, and which is the patent in suit in the case of New Jersey Patent Co. vs. American Graphophone Co.?

A. I am.

Q. 3. Was, or was not, the application for this patent founded upon actual work performed by you?

By Mr. Cameron:

Question objected to as leading.

By Mr. Dyke:

Question reformed as follows:

Q. 4. How did you come to make this application for patent?

A. Does it mean why I did it, or how I come to do it. I don't understand it.

Q. 5. I mean to inquire, Mr. Joyce, simply what led you to the filing of this application.

A. What led me to file the application; I made the cylinders and they were successful and I filed an application for patent.

Q. 6. When, to the best of your recollection, did you first make these cylinders? Is there anything in your recollection by which you can fix this time?

A. To the best of my knowledge and belief it was some time between 1894 and the time of filing the application. I made a change of my business in May, 1894; now I may have commenced in 1894 and probably not until 1895 to experiment.

Q. 7. You are reasonably certain are you, then, that you did this work during 1895?

By Mr. Cameron:

Question objected to as leading.

A. To the best of my knowledge and belief I believe I started in 1895.

Q. 8. Did you produce any of the cylinders or phonograms during 1895, so far as you can recollect? 10

By Mr. Cameron:

Question objected to as leading and notice is given that if counsel persists in asking leading questions of the witness, motion will be made to strike the questions and answers from the record.

A. I believe I did.

Q. 9. Explain the work which you did in as brief terms as possible, beginning with its earliest form and tracing its development? 20

A. I first made the copper mold, then after making the mold I made the records.

Q. 10. How did you make the mold?

A. By the electrotpe process.

Q. 11. Please explain this process?

A. I got a wax cylinder and deposited copper upon it.

Q. 12. How were you able to deposit copper upon a wax cylinder? 30

A. By suspending the cylinder in an electrotpe bath; that is, they call it a bath.

Q. 13. Was this cylinder when suspended in a bath in the original form in which you got or purchased it?

A. I placed it in a suitable case or mold to suspend it in the copper solution.

Q. 14. Was the copper deposited immediately upon the wax itself? 40



By Mr. Cameron:

Question objected to as leading.

A. I coated the wax cylinder with plumbago.

Q. 15. Having formed your mold, explain the next step of making the wax cylinder, confining yourself to your earliest work?

10 A. After completing the mold I poured melted wax into the mold.

Q. 16. How did you arrange the mold to receive the wax?

A. I prepared a metal base to hold the mold.

Q. 17. Did the two pieces, the mold and base, constitute the whole of your apparatus?

A. I inserted a core within the mold.

Q. 18. Have you now in your possession any specimens of the apparatus which you used?

20 A. I have.

Q. 19. Can you produce any such specimens?

A. I have in my possession several molds and herewith produce them, together with the bases and one of the cores.

Q. 20. Were all the molds which you produced made at the same time?

A. They were made at different times from different record cylinders.

30 By Mr. Dyke:

The molds, bases and core produced by the witness are introduced in evidence and marked for identification, respectively: "Joyce Mold No. 1," "Joyce Mold No. 2," "Joyce Mold No. 3," "Joyce Base No. 1," and "Joyce Base No. 2," and "Joyce Core."

40 Q. 21. Of the Molds Nos. 1, 2 and 3, was either of these molds made at a different time from the other?

By Mr. Cameron:

Question objected to as leading. The witness should be asked when the molds under consideration were made.

By Mr. Dyke:

Complainants' counsel states that the question was asked in the form given to it simply to ascertain the relative and not the exact time of making the molds. 10

By Mr. Cameron:

Counsel for defendant insists upon the objection and protests against the form of the question as it now appears that the same was intentionally leading.

A. They were.

Q. 22. Which was made first?

A. The mold marked "1" was made first. 20

Q. 23. What, if any, difference is there between this mold and those made later?

A. Mold 1 is a blank; the inside is blank. Molds 2 and 3 contain a record on the inside of each.

Q. 24. Mention any other differences which you may note?

A. Well, I don't know how to answer that.

Q. 25. Please compare the upper portion of Mold No. 1 with the similar portions of Molds Nos. 2 and 3? 30

A. Mold No. 1 has a slightly flaring mouth. No. 2 and No. 3 have a larger flare mouth.

Q. 26. What is the purpose of this flaring mouth?

A. To retain the melted wax.

Q. 27. When, as nearly as you can recollect, did you make Molds 1, 2 and 3?

A. I can't give the exact date, but it was sometime between the early part of 1895 and the date of filing the application. 40



Q. 28. How long, if you can remember, did you make Molds 2 and 3, or other molds similar to them, before filing the application?

By Mr. Cameron:

10 Question objected to until it appears of record that "other molds similar to them have been made" or were made by the witness prior to filing the application.

Q. 29. Embody with the answer to the previous question an answer to the following: Are Molds 2 and 3 all of the molds of this kind which you made?

By Mr. Cameron:

Question objected to as leading.

20 A. I made molds at different times. I made from ten to a dozen or more at different times. I was making molds for over a year at different times; a year or more at different times before filing the application.

Q. 30. Please assemble the mold, base and core as you used them, and explain how you made the record cylinders?

30 A. I place the core in the base, the bottom of the core fitting in the central opening of the base. I then place the mold around the core with the bottom of the mold fitting the slight cup-like depression in the base. I took a saucepan and put cylinder wax and melted it. I put the mold into a gas oven, turned on the gas and heated the mold in the gas oven. When the mold was heated and in proper condition, I took the melted wax and poured it into the mold between the core and the mold. After the wax had cooled I removed the core and then removed the cylinder from the mold.

40 Q. 31. Had you any way of telling how hot you heated the mold?

A. As hot as I could get it. I sometimes put the mold and the saucepan containing the wax into the oven and heated them both together. After the wax was sufficiently heated I took them both out and poured the wax into the mold.

Q. 32. What do you mean by sufficiently melted?

A. When it was melted as hot as I could get it, so it would flow into the mold.

Q. 33. Did you always heat the mold?

10

A. Always.

Q. 34. I am referring to all your experiments from the start to the finish?

A. When I first started I did not heat the mold.

Q. 35. What kind of results did you get with the cold mold?

A. I got a defective or imperfect record.

Q. 36. Explain the nature of the imperfections of the record so obtained?

A. The records so obtained were defective with blisters and bubbles on the face of the cylinder.

20

Q. 37. Did the records made with the hot molds have these imperfections?

By Mr. Cameron:

Question objected to as leading.

A. The first records I made had some.

Q. 38. How was it with the rest?

A. I concluded the trouble was that the mold was not sufficiently hot.

30

Q. 39. What did you then do?

A. I heated my mold still hotter. After the first were imperfect I got the mold and wax the same temperature by putting them both into the oven and heating them together. The result was a perfect cylinder. I discovered that by having the wax and the mold the same temperature there was harmony between the wax and the mold and the result was a perfect cylinder.

40



Q. 40. Explain about the congealing of this cylinder and when it began?

A. I never timed the congealing, but it congealed slowly.

Q. 41. Please explain further and state when you first noticed the congealing after pouring the wax under the conditions which you have named?

10 A. A few minutes after pouring the wax it congealed on the edge of the lip of the mold and on the upper part of the core, and then there was a slight shrinkage of the surplus wax within the lip. Then sometimes I cooled the inside core.

Q. 42. Who, if any one, witnessed the work which you did with these molds, and which you have just described?

A. My son, Maurice E. Joyce.

Q. 43. Having made these record cylinders, what did you do with them?

20 A. I put them on a graphophone and tested them.

Q. 44. With what result?

A. Those that were satisfactory I retained, and if I found any one not satisfactory I threw it aside.

Q. 45. Did you manufacture successfully any considerable number of molded record cylinders in this way?

By Mr. Cameron:

30 Question objected to as leading.

A. I should judge I made several dozen of them.

Q. 46. Did you do all of the testing of the records yourself?

By Mr. Cameron:

Same objection.

40 A. When I first started I had no graphophone. I took the records, several of them, to the Columbia Phonograph Company, and had them tested on their machines in their shops on Pennsylvania Avenue.

Q. 47. By whom?

A. By some of the employes. The last one I had tested was tested by their manager.

Q. 48. Do you know his name?

A. I forget his name; but he pronounced them perfect records.

Q. 49. Did you have any conversation with him respecting the records?

A. I am under the impression he told me he would like to submit that record to Mr. Easton. 10

Q. 50. What did you say to that?

A. I objected at the time. I told him I did not care about submitting it at that time.

Q. 51. Were there any other persons to whom you talked?

A. Yes; I borrowed a graphophone from Stilson Hutchins. Before borrowing the graphophone from Stilson Hutchins I had some records tested on his graphophone. I talked with several persons as to my experimental work; as to what I was working on. 20

Q. 52. Any one else connected with the Columbia Phonograph Company?

By Mr. Cameron:

The question objected to as leading.

A. Oh, yes; with several of the salesmen I was acquainted with. I used to buy wax from them, and they knew I was experimenting in that direction. 30

Q. 53. Did you have any conversation with any of the officials of the Columbia Phonograph Company?

By Mr. Cameron:

Counsel for defendant renews his objection to the leading character of these questions and specifically objects to the last question as grossly leading in character and renews his 40



notice that at the proper time defendant will move to strike from the record all of the questions and answers open to this objection.

10 A. On one occasion the Washington manager of the Columbia Phonograph Company called upon me, and introduced a gentleman whom he represented as being vice-president of the New York Phonograph Company. Both of them asked me how I made these records. I refused to tell them how. I told them that after the patent was issued they would probably know all about it.

Q. 54. What do you mean by the New York Phonograph Company in your previous answer?

A. I mean the New York office of the Columbia Phonograph Company. In other words, he told me that this man was vice-president of the Columbia Phonograph Company. I concluded the man was from New York.

20 Q. 55. What was the material which you used for molding the record?

A. I bought the material from the Columbia Graphophone Company; old broken cylinders.

Q. 56. Was what you have related the whole of what passed between you and the Columbia Phonograph Company?

By Mr. Cameron:

30 Question objected to as leading.

A. When I first started Mr. Easton was manager of the Washington Columbia Phonograph Company. I spoke to him and told him I had a method of duplicating cylinders. Now, I think he seemed to take an interest in the thing, and a little while after that he left for New York. At that time the Columbia Company had a law suit pending with some man, and Mr. Easton asked me if I could duplicate some of the flat wax disks. Mr. Easton afterward went to New York and I lost sight of him.

40

RECESS.

Q. 57. Mr. Joyce, I hand you two papers and ask you to explain what these papers are and what you know about the matters treated of therein?

A. The paper signed "Robert Fletcher Rogers" was in reply to a letter I wrote him, and acknowledges the receipt of a cylinder I sent him. The letter is as follows:

10.

ROBERT FLETCHER ROGERS,  
Attorney at Law and  
Counsellor in Patent Causes.  
45 Broadway.  
Cable Address: BOBROGERS.

20

NEW YORK, July 5th, 1898.

Maurice Joyce, Esq.,  
No. 414 11th Street, N. W.,  
Washington, D. C.

Dear Sir:—

I beg to acknowledge receipt of your favor of 29th ultimo., which should have been acknowledged before, as well as of a graphophone cylinder received by express. I have been unable to exhibit this as yet to the Graphophone Company for the reason that Mr. Devine and others have been absent from the city. I shall attend to the matter with all possible speed and communicate with you according to instructions.

30

Very truly yours,

(Signed) ROBERT FLETCHER ROGERS.

The other paper is a letter signed by Mr. Easton is one forwarded to me by Mr. Rogers. This letter is as follows:

40



*Maurice Joyce.*

## EXECUTIVE OFFICES

## COLUMBIA PHONOGRAPH COMPANY

Sole Sales Agent for the American  
Graphophone Company.

10

Bowling Green Offices: 5, 7, 9 & 11 Broadway.  
NEW YORK CITY, July 9th, 1898.

Mr. R. F. Rogers,  
No. 45 Broadway,  
New York, N. Y.

*My Dear Sir:—*

20

We were interested in the record submitted by you to-day as coming from Mr. Joyce. Such records would not be commercially saleable, because of harshness and a tendency to run blind; but if made from a permanent master capable of refinement and improvement and of very cheap and quick manufacture, Mr. Joyce would seem to be on the right track, and should be encouraged to proceed with his work.

Yours truly,  
(Signed) E. D. EASTON,  
*President.*

Dictated to and transcribed  
from the new  
GRAPHOPHONE.

30

At the suggestion of Mr. Hutchins, who was interested in the thing, I forwarded this cylinder to Mr. Rogers, in reply to his request for a cylinder. Mr. Rogers wanted to submit it to the Columbia Graphophone Company of New York. I received these letters from Mr. Rogers.

By Mr. Dyke:

40

The letters referred to and spread at length on the record in the preceding answer are introduced in evidence and marked "Complainants' Exhibit, Robert Fletcher Rogers' Letter

to Joyce, July 5, 1898," and "Complainants' Exhibit, Easton's Letter to Rogers, July 9, 1898."

By Mr. Cameron:

The letters offered in evidence are objected to at this time since the authenticity of the same has not been properly proved. They are further objected to as immaterial and irrelevant. They are further objected to as only embodying a fragment of the correspondence of which they purport to be a part, and the remaining parts of this correspondence are or were in the possession of the witness and remain unaccounted for. 10

#### STIPULATION.

It is hereby stipulated between the respective parties to this suit that the three molds, two bases, the core, and the two letters offered in evidence in connection with the testimony of this witness may remain in the custody of the complainants, subject to production at any time upon reasonable notice. 20

Q. 58. Have you any further portions of this correspondence in your possession, to your knowledge?

A. I could not find any.

Q. 59. Did you endeavor to find it?

A. Yes. I searched for it, and was unable to find any. 30

Q. 60. How did you forward the cylinder to Mr. Rogers?

A. By express.

Q. 61. You wrote Mr. Rogers, I presume?

A. Yes.

Q. 62. Did you keep a copy of the letter?

A. No.

Q. 63. How did you come to preserve the two letters which have been introduced? 40



A. I filed them with some other papers, and I found them when I searched for them.

Q. 64. How was it that you came to preserve these particular letters and apparently did not preserve the remainder of the correspondence?

A. I did not make a copy of any of my letters forwarded to Mr. Rogers.

10 Q. 65. Did you ever get the cylinder back from Mr. Rogers?

A. No.

Q. 66. Where is that cylinder now if you know?

A. I believe that Mr. Rogers still has it in his possession.

Direct examination closed.

Cross-examination of witness by Mr. Cameron:

20 x-Q. 67. Mr. Joyce, I call your attention to the mold and base No. 1, which has no record in reverse on the interior of the mold. I take the core offered here in evidence and insert it inside of the cylinder with its smaller end downward, and ask you if when you first tried to mold wax in this cylinder you used it in the condition I now show it with the core in position within the mold?

A. I did.

30 x-Q. 68. Please tell me the earliest date to which you are willing to swear when you used this mold No. 1 in this position?

A. To the best of my knowledge and belief it was from eighteen months to two years prior to the filing of the application. I think I would be justified in swearing to two years.

40 x-Q. 69. I have no doubt, Mr. Joyce, of your entire candor, but this is a matter that occurred a good many years ago, and I again wish to ask you as to the earliest date to which you are willing to make oath that you used this device; and in answer-

ing the question please tell me how you fix the date, if you can positively fix on any date?

A. In May, 1894, I made a change in my business, and it was some time after that change that I commenced on this record or cylinder.

x-Q. 70. Am I to understand from your answers that you know it was after May, 1894, and prior to Oct. 13, 1897, but that you cannot undertake to fix the date any nearer than that?

10

By Mr. Dyke:

Question objected to as without foundation in the testimony which this witness has already given, the witness having just testified that he used Mold No. 1 in the manner described at least from eighteen to twenty-four months prior to the filing of his application. This is evidently an effort on the part of defendant's counsel to make an admission entirely in conflict with what witness has heretofore stated, since defendant's counsel could not have understood from the witness' statements that the witness cannot undertake to fix any date any nearer than May, 1894, or October, 1897.

20

By Mr. Cameron:

Defendant's counsel calls attention to the fact that the statements contained in the preceding objection by complainants' counsel were not in accord with the facts. The witness has not testified that he used the Mold No. 1 at least from eighteen to twenty-four months prior to the filing of his application, but merely has expressed it as his "belief" that he so used it. Question 69 called for the earliest date to which he was willing to make oath, and in answer thereto the witness states that he changed his business in 1894 and that it was some time after that change. Defendant's counsel insists that the question is not only a proper one, but one that was designed to be perfectly fair to the witness, who is certainly

30

40



able to state whether or not he can fix the date any nearer than he has done, and the question is insisted upon.

By Mr. Dyke:

10 Complanants' counsel states that if the question asked be construed to be merely the query "Whether or not he can fix the date any nearer than he has done," that it is certainly a proper question, and that he has no objection thereto; but Complainants' counsel must insist upon his objection to the question as originally put.

By Mr. Cameron:

Defendant's counsel replies that the question as it stands on the record is the question to which he demands an answer to from the witness.

20 By Mr. Dyke:

Former objection renewed.

30 A. My memory is bad on dates; it never was good on dates. I don't know that I can fix the exact date. The fact is that I experimented, and it was sometimes over a week and sometimes over a month before I took it up again. I know I was some time working on the thing. I feel satisfied it was over a year before I made application. I find it right hard to go back and fix upon anything that would remind me of the earliest time that I started the thing, so as to swear to the date.

x-Q. 71. Did you purchase all of the wax that you used in these experiments from the Columbia Phonograph Company?

A. I purchased some and the young man there gave me some broken cylinders; threw them in.

40 x-Q. 72. Did you purchase the first wax which you used from the Columbia Phonograph Company?

A. I got it; I don't know whether I purchased it or not. I got some and purchased some. The wax that I got was old broken records; all the wax that I used was from Columbia records.

x-Q. 72. Are you willing to swear that the first wax you obtained from the Columbia Phonograph Co. was not obtained in the Spring of 1897?

A. I cannot say.

x-Q. 73. I observe that the core which you say you employed has a smooth exterior surface. I call your attention to a picture showing a mold with a smooth bore mounted on a base and having an interior tapering core which core, however, has a spiral groove formed thereon; and ask you if, with the exception of the spiral groove, it is not like the mold No. 1 with the core inserted therein? 10

A. I would say that this mold is in more than one piece. The top is separate from the body part. 20

x-Q. 74. That is the only substantial difference outside of the fact that the core has a spiral groove on it, is it not?

A. It is different here; the base is different, and the upper end is different. That I consider an additional piece.

By Mr. Dyke:

The foregoing question, and any examination along this general line, is objected to for the reason that the witness has not qualified as an expert skilled in the comparison of one patent with another, or as an expert skilled in the reading of drawings. This witness was offered purely as a fact witness, and this testimony being out of the scope of the direct examination is objected to as improper cross-examination. 30

x-Q. 75. At the time you began your experiments did you know it was old in the talking-machine art 40



to make a blank cylinder by pouring the molten wax into a cylinder having a smooth interior surface, which cylinder is mounted on a base supporting a tapering core within the cylinder, and having a flaring mouth part to readily conduct the molten wax into the space between the core and the interior face of the cylinder?

10 By Mr. Dyke:

Counsel for complainants feels that he must protest most strongly against this improper effort to transform a witness simply to facts as to what his own practice has been into an expert witness who shall inform the court what the art was prior to the doings of this witness. The question is objected to as incompetent, there being absolutely nothing on the record to show that this witness is qualified to answer such a question; and it is further objected to on the ground that it is not at all within the scope of a proper cross-examination. Defendant's counsel is notified that if he persists in this line of questioning he will have made the witness his own.

20

By Mr. Cameron:

Defendant's counsel replies that in his direct examination inquiry was made of the witness as to how he came to make the application and when he first made the cylinder in question. The question objected to by complainants' counsel is one calling for a fact entirely within the knowledge of the witness, viz., as to whether he knew at the time he says he made cylinder No. 1 that it was old to make a cylinder of the kind described in the question. Defendant's counsel declines to make the witness his own and insists upon the question.

30

By Mr. Dyke:

In view of the foregoing statement by defendant's counsel, further objection is made on the

40

ground that the question is entirely immaterial, what this witness did being precisely the same thing entirely irrespective of any information he may have as to the prior state of the art. Defendant's counsel is asking a question which can only properly be asked of an expert witness introduced in his behalf.

A. I did not.

x-Q. 76. When you first began your experiments I understand you to say that you employed a cold mold, is that correct? 10

A. Yes.

x-Q. 77. And subsequently you adopted the practice of heating the mold, did you not?

A. I did.

x-Q. 78. Please tell us what it was that led you to try the use of a hot mold instead of a cold mold?

A. The results from the cold mold were not satisfactory. 20

x-Q. 79. Well, why did you then try a hot mold? What led you to do this?

A. To see if I could get better results.

x-Q. 80. Had you learned that it was old in the casting art in casting certain articles of wax to employ a hot mold?

A. I had never seen it done.

By Mr. Cameron:

Question repeated. 30

By Mr. Dyke:

Same objection as to x-Q. 75. Complainants' counsel must insist that in the direct examination the witness was asked only what he had done and not what information he had previously obtained. The question is clearly without the scope of the direct examination. 40



A. I had read about casting candles.

x-Q. 81. In hot molds?

A. I believe the molds were hot or warm.

x-Q. 82. Did you not say to me a few moments ago that you read in an encyclopedia about casting candles in hot molds?

A. Either hot or warm; I can't swear that they were hot; they were either hot or warm.

10 x-Q. 83. And this led you to the casting of your wax in hot molds, did it not?

A. I had cast a wax cylinder in a copper mold years previous to that patent (indicating Edison patent No. 414,761).

x-Q. 84. You are an electrotyper, are you not?

A. I am an electrotyper, an engraver, photo engraver, stereotyper, and a printer.

20 x-Q. 85. And your business made you more or less familiar with the general art of casting, did it not?

A. I am familiar with the art of casting stereotypes.

x-Q. 86. And you knew that it was common practice to cast various materials in a hot mold, did you not?

A. I knew it was common practice to cast stereotype plates in a hot mold.

30 x-Q. 87. Your invention as I understand it consists in casting fused wax-like material into a hot mold, the wax-like material and the mold being of substantially the same temperature, cooling the mold and contents so as to cause the material to shrink away from the surface of the mold, and then removing the casting, does it not?

By Mr. Dyke:

40 Complainants' counsel again insists that this witness was produced to testify to what he had

done and that the witness is not called upon to define his invention. The witness is notified that his invention is defined in the claims of his patent and he is instructed that he need not answer this question unless he is ordered to do so by the Court, upon proper application.

By Mr. Cameron:

The question is insisted upon.

10

By Mr. Dyke:

It is further objected that counsel for defendant in framing this question has included only a portion of one of the claims of the patent, as defining the invention, when as a matter of law the entire claim is necessary to define any invention.

A. I refuse to answer this question. The specification is sufficient.

20

x-Q. 88. Did you make this invention set out in the specification?

A. I did.

x-Q. 89. Did you employ a hot mold?

A. I did.

x-Q. 90. Did you cast in said mold fused wax-like material?

A. I did.

x-Q. 91. Was said material at substantially the same temperature as the mold?

30

A. The mold and material were both inserted into a gas oven. They were kept there until the wax was melted and were taken out and were both of the same temperature to the best of my judgment.

x-Q. 92. Were the mold and contents cooled to cause the material to shrink away from the surface of the mold?

A. I sometimes cooled the mold and sometimes set the mold aside to cool of itself.

40



x-Q. 93. And did this cause the material to shrink away from the surface of the mold?

A. The cooling did.

x-Q. 94. Was the result any different when you employed a hot mold from what it was when you employed a cold mold?

A. The results were different.

10 x-Q. 95. You say you cast the record by pouring the molten wax into the hot mold, then cooling the mold to cause the material to shrink away from the mold. What do you mean by "casting"?

A. It is hard for me to define "casting" in the absence of a dictionary.

x-Q. 96. I did not ask you to define "casting" but what you mean by casting?

20 A. Now in stereotyping we pour the metal into the mold, we call that "casting," the result from that we call the "cast." I would call pouring this wax into this mold "casting," and I would call the resulting cylinder a "cast."

x-Q. 97. As a practical operation how would pouring molten wax into a hot mold differ in the result obtained from dipping a cold mold into the hot wax and then removing it before the hot wax which had congealed on the cold mold had melted?

By Mr. Dyke:

30 This question is without foundation in the direct examination of this witness, it not appearing that the witness has any information about dipping a cold mold into molten wax and removing it therefrom before the hot wax which had congealed on the mold had melted. The question is objected to as incompetent and as not within the scope of the cross-examination.

A. I don't know, never having seen the operation last-named.

40

x-Q. 98. You stated, I believe, that when you undertook to cast a record in a cold mold the resulting record was defective by reason of what you termed "blisters," and "bubbles." Will you please tell us what you meant by bubbles on the cast record?

A. I would call them small indentations and some larger ones. When you pour hot wax into that cold surface it shrinks away from it and does not run sharp, and does not run into the undulations of the record groove. In other words, it does not run "home." 10

x-Q. 99. Then by "bubbles" you meant indentations, is that correct?

A. Yes, indentations.

x-Q. 100. And I presume you meant that these indentations were caused by bubbles? Is that right? 20

A. Yes, that is right. They are caused by the cold air in the mold.

x-Q. 101. You say that when you first brought this matter of your cast records to the attention of the manager of the Columbia Phonograph Co. in Washington he pronounced them good records?

A. Yes.

x-Q. 102. Was that before or after you filed your application? 30

A. I think it was after.

x-Q. 103. How long after this was it that the gentleman who was introduced to you as the vice-president of the Columbia Phonograph Company of New York visited you?

A. I cannot say.

x-Q. 104. Was it before or after you sent, as you allege, a record to Mr. Rogers in New York?

A. I think it was before, but I am not certain.

x-Q. 105. It is stated in your patent that the 40



heating of the mold slightly expands it. Was this the object in heating the mold?

A. The object was to expand it and at the same to enable the wax to run sharp into the lines of the mold.

x-Q. 106. How did heating the mold cause the wax to run sharp into the lines?

10 A. Melted wax will run wherever you pour it provided the surface against which you pour it is warm or hot so as not to chill it. For instance, you can take a piece of stereotype metal and draw a series of lines in that metal and if the wax is warm it will take up all the fine lines, if the plate and wax is warm. If you pour the wax onto a cold plate the lines will not run sharp.

x-Q. 107. Then you think you could not get a sharp impression or casting if the molten wax were brought in contact with a cold mold?

20 A. I believe not, the wax is very sensitive to cold, particularly.

x-Q. 108. As I understand you, you found this to be true when you undertook to cast a record cylinder into a cold mold, did you not?

A. I did.

30 x-Q. 109. And the invention which you finally sought to patent therefore put forward as one of its characteristics that the mold must be a hot mold, did it not?

A. The mold in my judgment must be a hot mold in order to get good results, or a good cast.

x-Q. 110. And that is the reason why you emphasized in the description which you gave of your invention, when you drew your patent application, that the mold must be a hot mold, was it not?

A. Yes.

40 x-Q. 111. And you would regard a process of casting a record which brought a cold mold into con-

tact with the molten wax as a different process from that of your invention, would you not?

A. That depends upon the composition of the mold; further I think a metal mold, unless heated, always carries a chill with it unless heated in some manner.

x-Q. 112. Quite right. But you would regard a process of casting a record which brought the molten wax into contact with a cold mold as different from your invention, would you not? 10

A. Well, I am not sufficiently expert to define that. I can only explain as far as I went with the process.

x-Q. 113. Did your invention include the use of a cold mold?

By Mr. Dyke:

The question is objected to as defendant's counsel is again endeavoring to have the witness define what his invention was. There is no objection to the witness answering questions as to what he did, but he has not qualified or shown in any way that he is competent to define what is an invention and what is not an invention. 20

A. The specifications and claims say what it is. In answer to that I should say that the invention is whatever they allow you in the claim. 30

Adjourned to meet at eleven A. M., Tuesday,

February 25, 1908.

WASHINGTON, D. C., Feb. 25, 1908.

Met pursuant to adjournment.

Present: Parties as before.

Cross-examination of Mr. Maurice Joyce continued. 40



x-Q. 114. When you first set out with these experiments, your object was to produce molded duplicates of the commercial wax sound-records, was it not?

A. My object was to duplicate records.

x-Q. 115. And did you know of any records other than the commercial wax sound-records?

10 A. I bought records from the Columbia Phonograph Company which they told me were duplicate records.

By Mr. Cameron:

Question repeated.

A. I knew of no records except those I purchased.

20 x-Q. 116. And those were the cylindrical records made of material which you have been referring to in the testimony as of wax, were they not?

A. I believe so.

x-Q. 117. And it was your object when you first started out to see if you could not mold duplicates of these records, was it not?

A. My object was to duplicate those records.

x-Q. 118. By molding or casting?

A. By casting in a mold.

30 x-Q. 119. And the first mold you made was one that did not have any record lines on the interior of the mold, was it not; in other words, it was the smooth bore mold No. 1 which you have shown us?

A. This, I believe, was the first mold I made to cast a cylinder.

x-Q. 120. Did you expect to get a duplicate record from a smooth bored mold?

A. I did not.

x-Q. 121. Then why did you use such a mold?

40 A. I wanted to see if the cast would deliver from the mold; that is, I wanted to see if the graphophone wax would deliver.

x-Q. 122. In other words you wanted to learn whether the wax would contract sufficiently to permit the cast to be taken out of the mold?

A. I did.

x-Q. 123. As a matter of fact, did you know at that time that it had been old for over forty years to cast wax into a smooth bored mold and, when the wax had been cooled, the casting was then readily withdrawn from the mold?

10

By Mr. Dyke:

Same objection as to x-Q. 75.

A. I did not at the time I made this mold.

x-Q. 124. You subsequently used a mold, I understand, that had a record in reverse on the interior of the mold, did you not?

A. I did.

x-Q. 125. And later on in your experiments you heated this mold so that it was at about the temperature of molten wax and after the mold was heated and the wax melted you poured the melted wax into the mold, did you not?

20

A. I did.

x-Q. 126. And you then chilled the mold and its contents and then withdrew the molded record from the mold, did you not?

A. I did.

x-Q. 127. As a matter of fact did you know, at the time you allege you did this, that it had been old for over thirty years to heat a mold and melt wax, the heat of the mold being at approximately the same temperature as the molten wax, and then pour the melted wax into the heated mold, then chill the mold and contents, and withdraw the cast wax from the mold?

30

By Mr. Dyke:

Same objection as to x-Q. 75. This question is without the scope of the direct examination.

40



A. Not at the time I made these casts.

x-Q. 128. I understand you to say you are a printer?

A. I am.

x-Q. 129. I suppose you know then what a printer's inking roll is?

A. I do.

10 x-Q. 130. At the time you were making these experiments, did you know, as a matter of fact, that it was common and well-known in the art in making printers' rolls to pour the molten material for the rolls into a previously heated mold, then chill the mold and contents and after chilling to withdraw the cast roll from the mold?

By Mr. Dyke:

20 The objections already made to questions calling for the knowledge of the witness at the time of his work in making record cylinders are repeated as to this question:

A. I know it was common to pour printers' roll composition into cold molds. I never saw the composition poured into a heated mold. The composition for printers' rolls does not shrink in the same manner that wax does, and hence it is not necessary to heat the molds, and the mold is not cooled in order to withdraw the roll from the mold.

30 x-Q. 131. In practicing your invention after you finally got it completed, you prepared a tubular mold having the record in reverse on its interior, did you not?

A. I made a mold upon the record.

x-Q. 132. And this mold which you made was made by electro-deposition of copper on the record?

A. It was.

x-Q. 133. And it had the record in reverse on its interior, did it not?

40 A. Yes.

x-Q. 134. You then introduced the molten material into this mold around the core, did you not?

A. I did.

x-Q. 135. You then caused the material to set, did you not?

A. I did.

x-Q. 136. And also to contract?

A. The material contracted in setting.

x-Q. 137. Now, let us understand each other: When the material begins to congeal and finally assumes a solid state while yet quite soft, it has set, has it not? 10

A. Well, now, I scarcely know how to answer that question. The material is within the mold and I can't tell the condition of it just then.

x-Q. 138. It is not fluid, is it?

A. It is not fluid, after it congeals, naturally.

x-Q. 139. Each particle of the material then is set or fixed in approximately the position which it will occupy in the finished casting, is it not? 20

A. I think that is a technical question for me to answer.

x-Q. 140. After you made your mold with the record in reverse in its bore and poured the molten material into the mold around the core, you permitted it to first pass from the fluid to the congealed or semi-solid state, did you not?

A. I permitted it to pass into the solid state within the mold. 30

x-Q. 141. If you take one of these finished wax records and subject it to any material pressure, it would break, would it not?

A. I have broken wax records pushing them upon the holder in the graphophone; they have dropped on the floor and broken. I have never tried how much pressure they would stand.

x-Q. 142. I call your attention to the first lines at the top of the first column of page 2 of your patent, in which you say that 40



"a good way to apply pressure, however, is to wait until the wax has partly *set* and then screw down the tapering core into its base 1" (*italics mine*).

and I ask you what you meant when you used the expression "set" as you did?

10 A. The object of that was that if there was a doubt as to the sharpness of this wax mold, pressure could be applied to the core to force it down into the base, but I found that this was not necessary and it was never used.

x-Q. 143. You have not answered my question. I did not ask you what the object was, I asked you what you meant by the expression "set" in your specification?

20 A. Well, cooled, set when it got beyond the fluid state.

x-Q. 144. And does not the material thus set or get beyond the fluid state before it gets cold?

A. I should judge so.

x-Q. 145. Now, returning to my x-Q. 135, after you had made the mold with the record in reverse in its bore and had poured the molten material into the mold around the core, the material then "set," did it not?

30 A. It set provided the atmospheric conditions were not too warm to keep it in a fluid state.

x-Q. 146. And the atmospheric conditions you took care to be in such condition that the material would thus set, did you not?

A. Yes.

40 x-Q. 147. Now, after you had made your mold with the record grooves in reverse in its bore, and had poured the molten material into the mold around the core, and had caused the material to set, you then still further cooled the material to cause it to contract away from the mold, did you not?

A. I sometimes cooled the material and sometimes did not. I sometimes cooled it when I was in a hurry to get it out.

x-Q. 148. By that you mean that you either cooled it or let it cool?

A. I sometimes cooled it, or I let it cool if I was not in a hurry.

x-Q. 149. And when the material was contracted you withdrew it from the mold lengthwise? 10

A. I did.

x-Q. 150. I understand then that in practicing your invention you made a mold by the electro-deposition of metal on the original record, thereby getting a mold with the record in reverse in its bore, that you then poured molten material into the mold around the core, permitted the material to set, then cooled the material or permitted it to cool, thereby causing it to contract, and then took the record out of the mold. Is that correct? 20

A. It is.

x-Q. 151. Now the only thing which you did in practicing your process and which I omitted from the last question was the fact that you heated the mold before you poured the material into it, was that not so?

A. I can't keep the run of that, but I admit that I heated the mold. 30

x-Q. 152. What did you do in practicing your invention, other than the heating of the mold, which is not mentioned in my x-Q. 150?

A. I would rather you would ask me a direct question rather than answer that.

x-Q. 153. I have no doubt of the perfect truth of your last answer but I am doing the questioning here and shall have to be permitted to put my questions in my own way. I again ask you, is there anything except the heating of the mold, which you did 40



in practicing your invention which I have not included in my x-Q. 150?

By Mr. Dyke:

10           Objection is made to the manner in which the defendant's counsel is proceeding with his questioning, its evident purpose being to confuse the witness. The question is further objected to for the reason that it calls for a conclusion.

By Mr. Cameron:

20           Counsel for defendant replies that he has sought to show this witness every consideration, since it is perfectly evident that the witness is seeking to answer the questions propounded to him in good faith. Counsel for complainant, however, in his direct examination has seen fit to draw out from the witness what he did in making this invention, and it is defendant's undoubted right to go into this matter fully and get a statement from the witness as to just what he did. This is the sole purpose of the question objected to and it is therefore insisted upon.

A. As I understand the question that is the only thing I did.

Cross-examination of witness closed.

30           Re-direct examination by Mr. Dyke:

Rd-Q. 154. Mr. Joyce, as you understand the subject, is a casting operation confined to the filling of a mold by pouring?

40           A. There are several ways of casting. In casting type the metal is pumped into the mold. In casting stereotype plates now-adays the metal is pumped into the mold. In the old method of casting stereotypes the molds were immersed into the molten metal. In casting monotypes or linotypes the metal is pumped into the mold or matrix.

Rd-Q. 155. I gather from your answer that you mean to say that a casting operation can be made by other modes than pouring, is that right?

By Mr. Cameron:

Question is objected to as grossly leading.

A. Yes.

Rd-Q. 156. Since you do not regard pouring as an essential to casting, what do you regard as the essential features in a casting operation?

10

By Mr. Cameron:

The question is objected to unless the witness is offered as an expert in casting, and counsel for complainants is warned that if the question is persisted in, defendant shall insist on the right of cross-examining the witness as an expert in casting.

20

By Mr. Dyke:

Question withdrawn.

Rd-Q. 157. Who, if you know, was the man named as Mr. Devine in the letter of Rogers in evidence as Complainants' Exhibit Robert Fletcher Rogers Letter to Joyce July 5, 1898?

By Mr. Cameron:

Counsel for defendant objects to the question as not proper re-direct, since in his cross-examination the witness was not asked a single question in the remotest way relating to the subject-matter of the question just propounded to the witness.

30

A. I understood Mr. Devine to be the vice-president of the Columbia Phonograph Company.

By Mr. Cameron:

Answer objected to as hearsay.

40



## RECESS.

Rd-Q. 158. Mr. Joyce you have been asked about the statement in your patent that the mold is expanded by heating. Did you endeavor to make any particular use of this expansion of the mold when you carried on the work of making molded duplicate cylindrical sound-records to which you have testified?

10

By Mr. Cameron:

Question objected to as not proper re-direct.

A. I knew that the metal expanded and shrunk on cooling, and I wanted to take advantage of whatever results there might be from the expansion and contraction thereof.

Rd-Q. 159. How was this of advantage to you?

20

A. I don't know that there was any advantage; I thought if there was I would take advantage of it. I knew that the metal expanded upon heating and shrunk upon cooling.

Rd-Q. 160. State as nearly as you can how long a time elapsed from the making and using of Mold No. 1, which has a blank interior surface, until you made a mold having a record groove in reverse upon its interior surface and cast a record cylinder therein?

30

By Mr. Cameron:

Question objected to as not proper re-direct.

By Mr. Dyke:

Attention is directed to x-Q. 117, to x-Q. 122, and the answers thereto, as showing that this mold and its purpose have been inquired about during the cross-examination of this witness.

By Mr. Cameron:

40

Counsel for defendant states that this matter was also gone into on direct examination and that the question now propounded to the wit-

ness relates to information which should have been brought out on such cross-examination; that defendant was entitled to such information in conducting such cross-examination and, moreover, that the question propounded does not relate to any matter specifically brought out by such cross-examination.

A. It may have been a few days between the time, probably a week; I can't tell exactly the time. 10

Re-direct examination closed.

Re-cross examination of witness by Mr. Cameron:

Rx-Q. 161. Was it not your idea that the mold when heated would expand and that upon cooling after the casting was allowed to partially set therein the mold would shrink and thereby exert a pressure on the casting and that you hoped to thereby get a more sharp impression? 20

A. I may have thought so at the time, but found that the shrinkage of the wax was greater than that of the mold, and found that the contraction of the mold did not have any effect upon the cast duplicate because the contraction of the wax was greater than that of the mold.

Rx-Q. 162. But at the time you made your application you specifically mentioned the expansion of the mold due to the heating, did you not? 30

A. Yes, this heating expands the mold slightly.

Rx-Q. 163. And you thought at that time that the contraction of the mold would exert pressure upon the cast, did you not?

A. I may have thought so.

Rx-Q. 164. As a matter of fact, did you not know that it was old at that time to use a heated mold in making a duplicate sound-record, which mold of course would contract when it cooled and thus exert pressure against the duplicate within the mold? 40



By Mr. Dyke:

10       The question is objected to as a further attempt on the part of defendant's counsel to inquire into what the witness knew when he performed the operations which he has specified, as distinguished from what he did, which was what the question originally propounded to the witness was directed to. The objection is that the question is not proper cross-examination, for this reason.

A. I did not. I never saw a duplicate cast record until I made one.

Examination of witness closed.

Signature and certificate waived.

20       MAURICE E. JOYCE, a witness produced on behalf of complainant, being first duly sworn, testifies as follows in answer to interrogatories by Mr. Dyke, to wit:

Question 1. Please state your name, age, residence and occupation?

Answer. Maurice E. Joyce; age 32 years; residence 922 M St., N. W., Washington, D. C.; occupation, Half-Tone Operator and Electrician.

30       Q. 2. Mr. Joyce, I place certain articles before you which are marked as exhibits in this suit as Complainant's Exhibit Joyce Mold No. 1, Complainants' Exhibit Joyce Mold No. 2, and Complainants' Exhibit Joyce Mold No. 3. Please state what these articles are, if you know?

A. They are copper molds for phonographic cylinders.

40       Q. 3. I also show you certain other physical exhibits in this suit marked Complainants' Exhibits Joyce Base No. 1, Complainants' Exhibits Joyce Base No. 2, and Complainants' Exhibits Joyce Core. Please state what these articles are?

A. The bases used in connection with molds for phonographic cylinders. The core is also used in connection with molds for phonographic cylinders.

Q. 4. Did you ever see these various exhibits before, and if so, where?

A. I have, and in the annex to the Evening Star Building, Washington, D. C.

Q. 5. In what portion of the Star Annex?

A. By that do you mean on what floor? 10

Q. 6. Answer as best you can, Mr. Joyce.

A. Third floor, also the fourth.

Q. 7. To what is that floor of the Star Building Annex devoted?

A. To Maurice Joyce Engraving Company.

Q. 8. Do you know Maurice Joyce, who has just testified in this case?

A. Yes, sir.

Q. 9. Who is he?

A. My father. 20.

Q. 10. Has he any connection with the Maurice Joyce Engraving Company, of which you just spoke?

A. Yes, sir. He is part owner of that business.

Q. 11. What does your father do?

A. He is an engraver.

Q. 12. Where does he work?

A. At the Joyce Engraving Company's plant.

Q. 13. That is the plant in the Star Building to which you have just referred, is it not? 30

A. Yes, sir.

Q. 14. Where are you employed?

A. Maurice Joyce Engraving Company.

Q. 15. Where were you employed during the years 1894-1897?

A. To the best of my recollection by the Standard Engraving Company and the Maurice Joyce Engraving Company. 40



Q. 16. Were you familiar with what your father was doing during those years?

By Mr. Cameron:

Objected to as leading.

A. Along certain lines, yes.

Q. 17. State what you know, if anything, about the molds, bases and core which you have just identified?

10 A. I saw the molds during the process of making from time to time; I saw the bases used in connection with the molds; I also saw the mandrel or core used in connection with the bases and molds. I also saw molds cast of wax. I saw bases, molds, mandrels or cores, together with wax placed in an oven, after which they were removed from the oven, the mold filled with wax, cooled or allowed to cool, and removed, placed upon a mandrel or core, and put on a phonograph fitted with a reproducer and heard tones of various kinds.

Q. 18. Who did this work?

A. Mr. Joyce, my father.

Q. 19. By the "mandrel or core" last mentioned in the answer that you have just given, do you mean the same mandrel or core which is an exhibit in this suit?

30 A. I mean the mandrel or core exhibited, or one similar to it.

Q. 20. Could a record be placed upon a phonograph mandrel with a core like that in it?

A. At that time, yes.

Q. 21. Have you any recollection of the time when the operations to which you have testified to as having witnessed were performed, and is there anything in your life or experience by which you can fix this time? If so, please state the time as near as you can and anything by which you can fix that time.

40

A. As near as I can recollect I should judge it to have been in the neighborhood of 1892 to 1894. I think that I left school in 1893, and believe that it was about that time that these experiments were carried on.

Q. 22. Can you fix this time with any certainty?

A. None other than as stated.

Q. 23. When was the change made from the Standard Engraving Company to the Maurice Joyce Company, if you know? 10

A. I remember the change but cannot state when it took place.

Q. 24. Can you fix the time of these operations relative to that change of business?

A. To the best of my knowledge it was before and after.

Direct examination closed.

20

Cross-examination of witness by Mr. Cameron:

x-Q. 25. Mr. Joyce I do not understand you to say that you have seen records made by the use of the identical molds and bases and core offered here as exhibits, do I?

A. Yes, sir.

x-Q. 26. All three of the molds?

30

A. That I cannot state, nor can I state that they were made from these molds, but I have seen records molded by this process by my father, Mr. Joyce.

x-Q. 27. By what process?

A. By placing mold in base, then placing mandrel or core in base, placed in gas oven, together with wax, after wax had melted poured into mold, after cooling, core or mandrel and mold removed, and have seen said cast placed upon mandrel, put in reproducing machine, and have heard musical 40



sounds, and tones. One of the casts that I heard on a phonograph made by said process I think was a Russian March.

x-Q. 28. Then you do not wish to be understood as swearing that you have seen these identical molds employed in making casts, do you?

A. The molds as exhibited, or similar ones, I can.

10 By Mr. Cameron:

Question repeated.

A. I could only do so after hearing a cast made from exhibited molds.

By Mr. Cameron:

20 Question repeated and the witness' attention called to the fact that he is asked whether he wishes to be understood as swearing that he has seen these identical molds employed in making casts.

A. I do not.

x-Q. 29. Did you ever see these identical bases employed in making casts?

A. I saw bases that I believe to be these exhibits.

x-Q. 30. Are you willing to swear that they were these exhibits?

A. Yes; because I have never seen any other than these.

30 x-Q. 31. Please examine Exhibit Mold No. 1. Did you ever see a record made in a mold like that?

A. I cannot without the aid of a magnifying glass tell whether or not Mold No. 1 has been made from a blank or a record. Therefore I cannot say whether I have seen a cast record made from said mold.

40 x-Q. 32. Then you do not wish to be understood in your answer to Q. 17 as saying that you have seen casts placed upon the mandrel of a phonograph fitted with a reproducer and heard tones of various

kinds,—I say you do not wish to be understood as saying that the tones you heard reproduced were taken from a cast like Mold No. 1?

A. I do not.

x-Q. 33. You did not make this exception when you were testifying in answer to Q. 17, did you?

A. I did not, for the reason that in answer to Q. 17 I did not have particularly mold No. 1 in mind.

x-Q. 34. You had just identified these molds, had you not? 10

A. I had.

x-Q. 35. And you were asked to state what you knew if anything about the molds, bases and core which you had just identified and in answer thereto you gave the answer under Q. 17, and you did not except Mold No. 1, did you?

A. When I identified the exhibit I did so because I believed that they were the ones I saw originally, and the only ones that were in existence when I first saw them. 20

x-Q. 36. Did you ever see any other molds similar to No. 1?

A. May I ask in what respects?

x-Q. 37. Did you ever see another mold just like No. 1?

A. I do not understand what you mean by "just like No. 1." No. 1 may or may not be a mold of a blank. 30

x-Q. 38. You have undertaken to identify this mold. You have it before you, and I again ask you if you ever saw any other mold like it? If you know you can say so. If you don't know you can say that.

A. I have seen molds similar to it.

x-Q. 39. Did you ever see one like Mold No. 1?

A. Now, that's a question that I am trying to answer with justice to myself and all concerned, but I cannot unless the attorney specifies in exactly 40



what respects I have seen, or have not seen, others like it.

x-Q. 40. The fact is you do not know whether you have ever seen other molds like this or not, do you?

10 A. That I cannot say, because, as before stated, I cannot tell whether or not the mold was made from a record cylinder or a blank. If I say that it is made from a record and it proves to be a blank I am wrong.

x-Q. 41. Now as you do not know whether this is a mold from a blank or from a record, how are you able to identify it as the mold which you have seen before?

20 A. I saw the molds which were made by coating a record or a blank cylinder with plumbago immersed in a solution of copper surrounded by an anode, a current applied, copper deposited on said blank and record, and I believe that the exhibits before me are those made by Mr. Joyce, my father. I have seen them a number of times since they have been made, and they all have the general appearance of having been made by that method.

x-Q. 42. Now, Mr. Joyce, don't you know that there are tens of thousands of such molds made in precisely the manner which you have just described?

A. I do not.

30 x-Q. 43. If such is the fact, and I assure you it is a fact, is there anything about these particular molds that enables you to say that these are the ones that you saw made?

A. If molds similar to these are made I have never seen them. I can call to mind that I think I can recognize these molds through their thickness.

x-Q. 44. Do you know whether your father made any molds in the year 1897?

A. I do not. I cannot call to mind anything that happened in 1897 in connection with these or any molds.

x-Q. 45. Do you remember any change which your father made in his business in 1894?

A. I know that a change was made. Whether or not it was in 1894 I cannot with any degree of certainty say.

x-Q. 46. Your father has stated that he made a change in his business in 1894 and that he knows he commenced experiments after he made that change in his business. If this is true then you are mistaken in your idea that you witnessed these operations in the neighborhood of 1892 to 1894, are you not?

A. If Mr. Joyce has stated that he commenced operations along this line in that year I will state that I do not care to contradict him, and my question was answered in accordance with the best of my knowledge and belief.

x-Q. 47. Will you make oath to having seen any of these experiments in the year 1892?

A. No.

x-Q. 48. In 1893?

A. No.

x-Q. 49. In 1894?

A. No.

x-Q. 50. In 1895?

A. No.

x-Q. 51. In 1896?

A. No.

x-Q. 52. In 1897 or 1898?

A. No.

x-Q. 53. The fact is that these events occurred a good many years ago and you cannot positively fix the year in which you think you saw them. Is not that true?

A. Yes, sir.



x-Q. 54. You say your father placed the mold in an oven and heated it before he poured the melted wax into the mold, is that right?

A. It is.

x-Q. 55. Did you ever see him mold the casting without heating the mold?

A. I have.

10 x-Q. 56. Did you ever hear any of the casts that were thus made reproduced on a graphophone or phonograph?

A. I cannot say that I have.

x-Q. 57. Can you say that you have not?

A. No.

x-Q. 58. Did you ever hear the castings that were made in a hot mold reproduced on a graphophone or phonograph?

A. I have.

20 x-Q. 59. You are positive that they were not castings that had been made in a cold mold?

A. I am.

x-Q. 60. When did you hear such reproductions?

A. On one occasion I saw a cast made by means of the heated mold, saw that cast placed on the machine, and heard musical tones from it, and I believe that the said cast was a reproduction of a Russian March. I do not know when.

30 x-Q. 61. Is that the only occasion upon which you are willing to swear that you heard a reproduction from a casting made in a heated mold?

A. Yes, being the first it made an impression, but after then I heard them on several occasions but I could not swear that they were made in heated molds.

x-Q. 62. Was the Russian March cast made in a mold like No. 3?

A. I believe it to have been.

x-Q. 63. Was it made in a mold like No. 2?

40 A. I believe it to have been.

x-Q. 64. Was it made in a mold like No. 1?

A. I believe No. 1 to be a mold of a blank, and consequently no.

x-Q. 65. Did you ever see any casting made in any one of these molds Nos. 1, 2 and 3 when said mold was heated?

A. I cannot swear that I saw casts made from these molds exhibited, but I can swear that I have seen casts made from molds whose general appearance resembled the exhibits, with the exception of No. 1, which as before stated I believe to be a blank. 10

Cross-examination closed.

Deposition closed.

Signature and certificate waived.

#### STIPULATION.

It is stipulated that MAURICE JOYCE, who has testified herein, has had more than one application in the Patent Office involving the duplication of graphophone or phonograph sound-records, and that Stilson Hutchins, if called as a witness would testify that, in return for certain moneys which he advanced to Mr. Joyce in connection with expenses incurred, he, the said Hutchins, had a part interest in an invention of Mr. Joyce relating to the duplication of graphophone or phonograph sound-records; and further that he would testify that he does not remember anything more than this about the matter. 20 30

Adjourned subject to notice.

#### DEPOSITION OF WALTER H. MILLER.

WALTER H. MILLER, a witness produced on behalf of complainants, being first duly sworn, deposes and says, in answer to questions propounded by Mr. Dyer, as follows: 40



Q. 1. Please state your name, age, residence, and occupation?

A. Walter H. Miller; age, 38; residence, Linden Place, Orange, New Jersey; occupation, manager of the Recording Department of the National Phonograph Company.

10 Q. 2. Are you the same Walter H. Miller who jointly with J. W. Aylsworth, filed the applications for patents Nos. 683,615 and 683,676, granted to the National Phonograph Company, here in suit?

A. I am.

Q. 3. Can you state where Mr. Aylsworth is at the present time?

A. At Fort Myers, Florida.

Q. 4. How long has he been at Fort Myers?

A. Somewhat over a month.

Q. What was the condition of Mr. Aylsworth when he went away?

20

Objected to as incompetent.

A. He had been very ill since November and was ordered away for his health and is not expected to return for several months.

Q. 6. The applications for patents Nos. 683,615 and 683,676 here in suit were filed July 31, 1900; prior to that date had you carried out the process and used the apparatus for duplicating phonographic records described in these patents, and if so, to what extent?

30

By Mr. Massie:

Objected to as calling for a conclusion.

A. During the latter part of the year 1898 we borrowed a mold from Mr. Wurth, who had charge of making the molds at the laboratory, and a few dipped samples were made by inserting a mold into a baking powder can with a hole in the bottom, and immersed the same by lowering it into a pot of molten wax. The mold was then chilled and which

40

allowed the film of wax to contract from the mold. Several records were made by this method from time to time, and active experiments were started in February, 1899. Up to this date the samples we had made were only thin films of wax, about 1-16 of an inch thick, and after February, 1899, we began to experiment with the view of making these records thicker, and succeeded in getting satisfactory results prior to January, 1902, when the records were first put on the market commercially by the National Phonograph Company, at which time we had six hundred selections placed in our catalog and stock made of same. 10

Q. 7. How did you happen to take up this problem of making duplicated phonograph records?

A. Aylsworth and I were talking over the proposition and we thought that we could mold a practical commercial record from a mold.

Q. 8. Did you ever discuss this question with Mr. Edison? 20

A. Quite frequently.

Q. 9. Did Mr. Edison request you and Aylsworth to undertake the development commercially of the problem?

A. Yes, sir, he did.

Q. 10. Was this before the latter part of the year 1898, when you borrowed the mold from Mr. Wurth, with which you made your first experiment?

By Mr. Massie: 30

Objected to as leading.

A. When Mr. Edison gave us instructions to go ahead with the experiments on these records, it was between the latter part of 1898 and February, 1899.

Q. 11. Then, as I understand it, you and Aylsworth discussed the feasibility of making molded records before Mr. Edison authorized you to go ahead and endeavor to develop the problem commercially? 40



A. We did.

Q. 12. How far did your experiments go towards demonstrating the commercial practicability of the process from February, 1899, when you appear to have commenced your active experimenting, until July 31, 1900, when the applications for patents Nos. 683,615 and 683,676 were filed?

By Mr. Massie:

10

Objected to as calling for conclusions as to "the process" and as to "commercial practicability."

A. We had a small commercial plant in actual operation producing commercial records for the market under the process described in these patents late in 1900.

20

Q. 13. Had you succeeded in making satisfactory copies of phonograph records by the process described in these patents prior to July 31, 1900?

By Mr. Massie:

Objected to as leading, and as calling for a conclusion with regard to the alleged process."

A. Assuming that these patents were filed on that date, July 31, 1900, I am positive that satisfactory records were made prior to that time.

30

Q. 14. One of the features of the process and apparatus disclosed in these patents is the formation of a series of ribs on the interior of the duplicate record; what was the particular purpose of using this feature, and what, if any, practical advantages does it possess?

40

A. The advantage of making the concentric rings in a molded record is that it is one of the best ways of making a true molded record. By true, I mean a record that runs concentric and does not wobble when put on a mandrel. Another advantage is that it enables us to turn out the surplus wax which is

not needed, and in this way cheapen the record. It is also a very quick method of boring cylinders and enables us to do it in one operation, although sometimes two are used. It has great advantages over the spiral rib record, inasmuch as in order to make a molded record with a spiral, it is necessary to use a core and chill the inside of the core as well as the outside of the mold, in order to allow the molded record to be released from the core. When this method is used, there is a contraction on the outside of the cylinder and also on the inside. The two contractions never being even, causes them to run out or become eccentric, much more so than records with concentric rings, as with our patents. Another bad point to records with a spiral thread, and made as explained above, that is by a core with a spiral groove, is that this uneven contraction makes the record much more brittle than made by the method under patents Nos. 683,615 and 683,676.

Q. 15. In reference to the saving in material by reaming out the interior of the records to form a series of parallel ribs, as disclosed in the two patents in suit, as compared with casting the records, with the spiral rib, without reaming, can you state approximately to what extent a saving is effected?

By Mr. Massie:

Objected to as immaterial, on the ground that among other things that neither patent is for a record having parallel or concentric rings, nor for the process of making such records.

A. I should say about 20%.

Answer objected to as incompetent on the ground that it does not appear that the witness is familiar with any other process of making molded records.

Q. 16. Are you familiar with any other process



of making molded records than that disclosed in the two patents referred to?

A. I am.

Q. 17. What process do you now refer to as being other than that disclosed in said patents?

A. The process of making sound records and blanks in patents Nos. 726,965, granted May 5, 1903, to W. H. Miller and A. N. Pierman, and patent  
10 No. 726,966, granted May 5, 1903, to W. H. Miller and A. N. Pierman.

By Mr. Dyer:

Copies of patents numbered 726,965 and 726,966, referred to by the witness, are offered in evidence and marked "Complainants' Exhibit, Miller-Pierman Patent No. 726,965 and Complainants' Exhibit, Miller-Pierman Patent No. 726,966."

20 It is admitted by counsel for defendant, subject to correction in case of error, that the applications for the patents last referred to were filed November 21, 1902, and that each of said patents was granted to the National Phonograph Company, one of the complainants herein.

30 Question objected to as not properly stating the process of the patent inquired of, and as irrelevant and immaterial.

A. This process was used by me to make records in an experimental way; in fact, I made some molded records which were used for masters. This process was also used in the factory under the supervision of Mr. Nehr to produce regular commercial work, but it was abandoned as not a perfect success, and I think the cause was due to the excessive breakage and discards made in the process.

40 Q. 18. In comparing the advantages of a process wherein duplicate records were finished by a ream-

ing operation, forming a series of concentric ribs on the bore, with a process of molding a record by casting a spiral rib on the bore, was your comparison based upon actual experience in the art, or merely upon theoretical considerations?

A. Upon actual experience in the art with the Miller and Pierman process.

Q. 19. You state that the molded records made under your process (Miller & Aylsworth patents in suit) were first put out commercially by the National Phonograph Company about January, 1902; are the records of the National Phonograph Company now made by the same process or have they been changed since that date? 10

Objected to as calling for a conclusion.

A. They are the same and have not been changed with the exception of improvement of molding the name at the end, which, however, is disclosed in our patents. 20

Q. 20. Are you able to say whether the molded records made by the National Phonograph Company under your process met with any public favor? I have reference, of course, to the records manufactured under the Miller & Aylsworth patents in suit?

Objected to first, as calling for a conclusion with regard to what is the process of the patents referred to, and second, as incompetent and immaterial. 30

A. They have become enormously popular, and at times we have had to produce over a hundred thousand a day.

Q. 21. Having reference now to the particular feature of forming a series of concentric or parallel ribs, on the record by a reaming operation, while the record is still in tight engagement with the mold, and while the material is sufficiently plastic as suggested in the Miller & Aylsworth patents in suit, 40



what, if any, commercial and practical value do you attribute to this feature?

A. It has the advantage of producing them cheaply; economizing on material, getting the best possible result with reference to having them run perfectly concentric; also, the advantage of molding them to produce the least brittle record with the material used.

10 Q. 22. By reaming the record, as suggested in the Miller & Aylsworth patents, what about the time required to finish the operation as compared to casting a spiral rib on the bore?

Objected to as indefinite.

A. The time consumed in making a record by either one of these processes varies somewhat as to the temperature of the wax and the length of chill, and I do not think there is any material difference  
20 in either as to time.

Q. 23. With reference to the reaming operation disclosed in these Miller & Aylsworth patents, where the reaming is performed while the record still tightly engages the mold, did you regard this as a feature of importance or as an unimportant detail?

Objected to as entirely incompetent and as utterly immaterial.

A. I thought this was one of the most important  
30 features in the process; in fact, I advised our attorney to be especially careful to cover all the points on this particular operation.

Q. 24. In your opinion as a practical man, would it be possible at the present day to make commercial duplicate records by casting a spiral rib on the bore?

A. Not in competition with the process now in use, namely, that covered by the Miller & Aylsworth patents.

40 Q. 25. That is to say, because of the special ad-

vantages which you have pointed out, as being obtained by this special process of reaming out the record while still in the mold. Is this correct?

A. It is.

Q. 26. Having reference to the two Miller & Pierman patents above referred to, numbered 726,965 and 726,966, of May 5, 1903, applications filed November 21, 1902, what if anything was done with this process prior to filing the applications for those patents? 10

By Mr. Massie:

The question is objected to as immaterial.

A. Experiments were started on this process around September 9, or the middle of September, 1902, and the object was to secure a record that was more or less indestructible. It was a method of molding a record by heating the mold to a temperature of about 300°, more or less, and inserting into the mold a ribbed core covered with sheet fiber, such as cotton, cloth or other material and pouring hot wax into it from the bottom by inserting it into a pot of wax with studs on the bottom of the core to automatically lift the mold and the wax would run in. It was then taken out and chilled in water both inside the core and out. It was then extracted by unscrewing the core from the record and the mold was then put in a cold jacket and the record extracted. 20 30

Q. 27. With the process of this Miller and Pierman patent No. 726,965, I understand that the mold and core were introduced into the heated wax-like material, which entered the space between the mold and the core, and heated the mold and the core to the temperature of the wax-like material. Is this correct?

A. That is correct.

Q. 28. And as I understand it, you also carried 40



out the modification of this process in which the mold and the core were independently heated before the wax was introduced. Is that correct?

A. That is correct.

By defendant's counsel:

10 Does the witness intend by the last answer to describe something set out in the Miller & Pierman patent?

A. I do not know whether it is in the patent, but I know that we did this. In fact, I am certain that was done prior to the entrance of the wax at the bottom as specifically shown in the Miller-Pierman patent No. 726,965.

20 Q. 29. In this latter patent, the statement is made that the winding of fibrous material around the core may be dispensed with, and a record be made wholly of a wax-like material by the process described therein, namely, by introducing the mold and core in the hot wax-like material so as to heat the mold and core to the temperature of the wax-like material which enters the space between the mold and the core. Did you ever carry out this process for making records wholly of wax-like material, or the equivalent process for that purpose consisting in first heating the mold and the core before the introduction of the wax-like material?

30 Question objected to as not properly stating the process of the patent inquired of, and as irrelevant and immaterial.

40 A. This process was used by me to make records in an experimental way; in fact, I made some molded records which were used for masters. This process was also used in the factory under the supervision of Mr. Nehr to produce regular commercial work, but it was abandoned as not a perfect success, and I think the cause was due to the

excessive breakage and discards made in the process.

Q. 30. Did you make molded records for masters by the Miller-Pierman process before November 21, 1902, the date of the applications for these patents?

Objected to as calling for a conclusion, and as tending to mislead in view of Q. 29.

A. I did.

10

Q. 31. Has this general process, consisting in introducing the hot wax-like material into a previously heated mold, or into a mold which was heated by the wax-like material, to your knowledge, been practically used by the National Phonograph Company, since the filing date of these applications, November 21, 1902, and if so, to what extent?

The objections are repeated, and the question is objected to as leading.

20

A. This method has been used to the extent of making a large number of our molded masters used for our regular business, and is now in use.

Q. 32. How perfect do you regard the process for making the duplicate records, consisting in introducing the hot wax-like material into a heated mold?

Objected to as indefinite and not stating sufficient details as to temperature, duration of operations and other manipulations.

30

A. This process is excellent and one of the best for accurate molding, but for production it is very inferior to the dipping method, since a higher class of labor is required to make it successful.

Q. 33. Are you familiar with the details of this hot mold process as the same is now practiced by the National Phonograph Company, and if so, please describe it?

40



10 A. The molds are inserted on a core and heated on a gas burner in such a way that the flame does not come in contact with the inside of the mold, to a temperature varying according to the composition from 250° up; we then pour wax in the top of the mold with a dipper; it is then inserted in cold water to chill it. When it is cooled to a somewhat plastic state, it is taken out of the water and the core pushed out, there being no threads on the core. The mold is then placed in a chuck in the lathe and reamed out as described in the Miller & Aylsworth patents Nos. 683,676 and 683,615, except that we do not turn ribs in them. The results of this method are used for masters to make molds to turn out our regular product.

Q. 34. In making molded masters, is a higher degree of perfection required than in making the regular product?

20 A. These molded masters for molds must be perfect in every sense; they must have a perfectly clean, polished surface, and absolutely free from air holes.

Without waiving objections already entered defendant's counsel cross-examines *de bene esse*.

By Mr. Massie:

x-Q. 35. Are you the W. H. Miller named in the two Miller & Pierman patents referred to herein?

A. I am.

30 x-Q. 36. What is the temperature approximately of the molten wax-like material you employed in carrying out what you understand to be the process of these Miller & Pierman patents?

A. Between 300° and 400° F.

x-Q. 37. I understand that you are familiar with the production of the molded master records made by the National Phonograph Company. Is the master wax employed for that purpose substantially the same as the wax employed for molding complainant's regular cylinder record?

40

A. I do not know the exact composition of this material, but its actions are very similar to that used in our regular process. I understand there is a slight change made in order to produce a certain shrinkage which is necessary to make the threads on the record come to the right number per inch.

x-Q. 38. So far as you are at present aware, except for the fact that the master wax is more accurately prepared as regard to shrinkage, there is no material difference between that and the ordinary wax of the Edison molded records? 10

A. So far as I know there is no other difference. You must remember I am not the wax man; we take our wax as it is given us to mold.

x-Q. 39. About what is the melting point of the master wax?

A. As near as I remember, about 290°.

x-Q. 40. Did you not mean that for about 190°F?

A. I did not. 20

x-Q. 41. In answer to Q. 26, you speak of heating the mold, to a temeptrature of about 300°, more or less. Does this mean degrees Fah., and did you actually read the temperature or is this from general impressions?

A. This temperature I speak of is Fahrenheit, and the way I judged the temperature of the mold, is that it is the custom to wet your finger and touch it quickly, or spit on it to see if it sizzles, and I assume that water boils at 212, and we wait until this hisses considerably, and from that I judge that the temperature of the mold must be considerably over 212°. 30

x-Q. 42. With regard to the process carried out by the National Phonograph Company in making its molded masters, is the temperature of the mold about the same, and is the temperature of the molten wax about the same, namely, about 300° F., more or less? 40



A. The molds are about 300° F., and the wax, or the temperature of the wax used, varies considerably. I have noticed from my own observations they would be molding satisfactory records between the temperatures of 325 and 400° F.

10 x-Q. 43. Please state every difference with regard to process and temperature, etc., between the method of making Edison molded records for the market and the method of making molded master records for the market?

20 A. The process used under the Miller & Aylsworth patents. We have a mold which is open on the top and bottom and is placed in a brass jacket. This brass jacket and mold is slightly warmed, I should say about the temperature of 100° F. It is placed in a can with a hole in the bottom in such a manner that when this can is lowered in a pot of wax, the wax enters the bottom of the can through the center of the mold to within  $\frac{1}{4}$  of an inch above the top, a brass cap being placed on the mold to prevent it from overflowing. This mold remains in the wax for about one minute and a half, in order to let the wax congeal to a sufficient thickness. It is then drawn out of the wax, taken out of the can and then out of the cylindrical jacket. The ends are then trimmed while in a plastic state, the mold inserted into a chuck and reamed. It is then placed  
30 in a cold jacket, which causes the cylinder to contract and become loose from the mold. It is then placed on a tapered shell, the same shape as the phonograph mandrel, and allowed to cool thoroughly.

For the hot process, I would refer you to my answer to Q. 33.

x-Q. 44. In carrying out what you have described in answer to Q. 33, which you refer to as the hot  
40 process, in your opinion, are you carrying out what

you understand to be the process of the Miller & Aylsworth patents in suit?

A. I am of the opinion that this is under the patents of Miller & Pierman.

x-Q. 45. Does that mean that in your opinion the so-called "hot process," as used in making the master records, does *not* carry out what you understand to be the process of the Miller & Aylsworth patents in suit?

10

A. My understanding of the hot process is that we use that part of the Miller & Aylsworth patents which refers to the reaming of the record before it has left the mold.

x-Q. 46. In Q. 29 you were asked regarding what is there termed the equivalent process of the Miller-Pierman patent, where the winding of fibrous material is dispensed with? In carrying out the process referred to (where the record is made wholly of the wax-like material) in your opinion were you practicing the process of the Miller & Aylsworth patents here in suit?

20

A. Those records which I referred to that we made for masters were reamed out before the cylinder left the mold; I do not think it would be possible to mold a record with a core in it without reaming it in some manner and use it for a master.

x-Q. 47. How long have you been familiar in a general way with the phonographic art?

30

A. I should say, roughly, 18 years.

x-Q. 48. During that period has it not happened quite frequently that the interior of the cylinder was reamed out whether it had spiral ribs, or other forms of ribs, or no ribs at all?

A. The process of reaming blanks has been used, I might say, from the beginning, but blanks are made entirely different from molded records, as they are first reamed on the inside; they are then put on a mandrel and turned on the outside, in order

40



to make them true. In the case of molded records, the outside cannot be tampered with.

x-Q. 49. I understand that sometime about the latter part of the year 1898, you and Mr. Aylsworth had done some work in connection with a record mold, a baking powder can and some melted wax; that you thereafter had one or more conferences with Mr. Edison, who authorized you to go ahead  
10 with the matter seriously; and that in February, 1899, you began active experiments, which resulted in the matters and things set out in the patent in suit. Can you state the substance of what you and Mr. Aylsworth had accomplished before you consulted with Mr. Edison on the matter and the substance of your disclosure to Mr. Edison?

A. The samples which we showed to Mr. Edison at this time were quite perfect as to their general surface, but their thickness as a record was not over  
20 3-32 of an inch. In order to play these records, we made a shell which would slip on the mandrel, and then this record would slip over that shell. This, as near as I can remember, is the exhibit we made to him.

x-Q. 50. I understand that for practical use such a record would be too thin, and that your work, beginning seriously in February, 1899, resulted in the production of castings having sufficient thickness.  
30 Please state what you did, what means you employed, etc., to make these substantial records which you did not employ in making the first thin ones?

A. Mr. Aylsworth and myself thought these records were quite commercial but, however, it was thought best to experiment to make them thicker, and in order to do this it was accomplished by a change in the composition and making the mold thicker.

x-Q. 51. If I understand you, before the inter-  
40 view with Mr. Edison with the molds you then em-

ployed, and with the particular "wax" you then employed, you succeeded in getting cast records that were only about 3-32 of an inch thick; but thereafter by employing a different composition and making the wall of your mold thicker (so as to contain more metal) you obtained a thicker deposit, which satisfied the requirements of the management of your Company. Please state in a general way the nature of the two different compositions and briefly show wherein they differed? 10

A. In all these experiments Mr. Aylsworth had charge of the wax end of the work, while I took care of the mechanical end. As near as I recollect, with the particular composition in which our records were only 3-32 of an inch thick, it was impossible for us to get it any thicker.

x-Q. 52. How about the appearance of the bore of the deposit obtained in those first instances? Was it perfectly smooth, or more or less lumpy or uneven? 20

A. The surface was perfectly smooth, as we reamed it with a straight knife.

x-Q. 53. I meant before any reaming, and after the deposit was chilled?

A. The surface was shiny, but when a cylinder is dipped in this manner it is always necessary to ream it, as it is always thicker in one end than the other. That is to say, the bore is of smaller diameter at one end than the other. 30

x-Q. 54. I understand that the thin casting as thus first obtained could not have been placed, without reaming upon a mandrel, if you had had a mandrel of the proper size? Was the deposit sufficiently thick to permit ribs either spiral or parallel to be cut therein?

A. They were not.

x-Q. 55. In casting sound records where a spiral 40



rib is cast simultaneously with making the record, wherein is any material wasted?

10 A. The fact that if you make a record with a tapered bore on the inside and a parallel surface on the outside, and you have contained in this bore a spiral thread elevated the same amount throughout the bore, it will take considerably more wax than if this same cylinder was made with a parallel wall on the outside and concentric rings made in it by scooping out considerable quantity of wax between these concentric rings, as is done in the Miller & Aylsworth process. In other words, by making the cylinder with a shell of the same thickness throughout (excluding the ribs, of course) less material will be required than if the wall of the cylinder varies in thickness from one end of the other, as for example, as suggested in the Miller & Pierman patent, and as was first used by the defendant with its first molded records.

20

Adjourned to 10 A. M., March 5, 1908.

March 5, 1908.

Met pursuant to adjournment.

Present:

Counsel as before.

30 ALEXANDER N. PIERMAN, a witness produced on behalf of complainants, having been first duly sworn, deposes and says in answer to questions propounded by Mr. Dyke, as follows:

By Mr. DYKE:

Q. 1. Give your name, age, residence and occupation.

40 A. Alexander N. Pierman, age 38, residence 327 Orange street, Newark, N. J.; occupation, experi-

menter in the employ of the National Phonograph Company.

Q. 2. How long have you been employed continuously in your present capacity?

A. Since the latter part of June, 1902.

Q. 3. Are you the same Alexander N. Pierman, who jointly with W. H. Miller filed on November 21, 1902, applications for patents, which subsequently resulted in the issue of patent No. 726,965, dated May 5, 1903, to W. H. Miller and A. N. Pierman, for Process of Making Sound Records or Blanks, and patent No. 726,966, granted to the same parties on the same date for Sound Record or Blank, the same being offered as exhibits in these suits by complainants in the taking of the deposition of Walter H. Miller, and marked "Complainant's Exhibit, Miller-Pierman Patent, No. 726,965, and Complainant's Exhibit, Miller-Pierman Patent No. 726,966?"

A. I am the same man.

Q. 4. Please explain what work you did, if any, which led up to the filing of these applications?

Objected to as immaterial.

A. The work which led up to the filing of these applications was being performed in the laboratory by Mr. Vanderway, under Mr. Miller's direction. This work consisted in taking a mold having a record on the end of the bore, placing therein a shaved blank cylinder, which fitted snugly, the ends being sealed by a rod passing through two metal heads, which also carried rubber gaskets which pressed on the end of the mold containing the blank cylinder, thereby sealing it, rendering it waterproof. The apparatus as assembled was plunged in boiling water which heated the mold first, the mold in turn communicated the heat to the surface of the blank contained therein, which



in turn became partly soft on its surface, thereby expanding, owing to the nature of the material of which the blank was composed. The expansion of the blank caused a perfect imprint of the record upon its surface. The apparatus was then removed from the water and chilled until it felt cold to the touch. It was then thoroughly wiped dry on the outside, the heads being removed, the blank or record was removed by drawing it from one end of the mold. One of these records made by what was known as the expanding process was shown to me by Mr. Miller. The process was also explained to me at the time, and my opinion was asked of it. I made the statement to Mr. Miller that if the record could be put on there in perfect form by simply warming the surface of the blank, it could be put on there better if the wax was poured in the mold when the mold was at the temperature of the wax. He said he didn't think it was possible to produce a perfect surface, without air bubbles, owing to the churning action of the wax when being poured in, but he said, however, it would do no harm to carry out the experiment, inasmuch as I thought it could be done. I then took a regular mold which was used for the expanding process, a mold which had been discarded because it was damaged accidentally while in use. I used this damaged mold in order to avoid spoiling another good one. This mold I placed on a gas burner and kept turning it, heating from the outside until it produced a hissing sound when touched with the wet finger. I also had an ordinary hollow cast-iron core, known in practice as a shell and used as a form for shrinking the dipped duplicates. This mold and core I stood on end on an iron plate, the plate being cold. I centered the core inside of the mold as near as possible by judgment. I then poured in melted wax, that is wax such as

is used for making original records. The temperature of this wax was about 360 degrees F. I filled the mold to overflowing, and as it shrunk I added a little more to fill it up as best I could. When this wax and mold cooled sufficient to set, I took a wet towel, wrapping it around the mold to chill it. I also took a wet piece of waste and stuffed it inside the hollow core, to extract as much heat as possible and cool it. The core being cooled faster than the outer mold, owing to the fact that it was much thinner, was removed first, as the wax shrunk away from it. The mold containing the molded record was then allowed to stand until the record shrunk and loosened itself. This cylinder or molded master was turned over to Mr. Miller for his inspection. While it did not run very true on the phonograph, owing to the fact that there were no positive means for locating the core, still it could be reproduced from one end to the other, and satisfied Mr. Miller that the process was far superior to the expanding process upon which he had been experimenting. He then advised me to have suitable apparatus made whereby the core could be located centrally in the mold, which I did in a temporary manner. I again made several experimental records, which were also submitted to Mr. Miller for his inspection. They were made in the same way. Mr. Miller agreed to have a base and core made in one piece, carrying a ridge or flange on the outer edge of the base, in which the end of the mold was located. This apparatus was finished in the course of about a week. I then continued further experiments with various compositions of wax, with the idea in view of getting the proper shrinkage. This, we found could not be done with the molds we were then using, as the feed or pitch of the screw on the machine on which the original master was made from which

10

20

30

40



the mold was in turn made, was not coarse enough. Mr. Miller then caused to be made a feed screw for the phonograph of special thread, the pitch of which was estimated according to the shrinkage of the wax, which we found to be most suitable for that purpose. This screw thread was 97 1-3 threads to the inch. We had records made by an artist specially on this thread. Molds were made from these records, which were called "mother molds." I molded records in these mother molds, which were in turn electroplated, thereby forming a duplicate mold. These molds being used in the same manner as the mother molds, with the exception that the commercial composition or wax was melted and poured in the mold, instead of the master-record wax. We found the shrinkage from these second molds to be near enough to 100 threads per inch to make it a commercial proposition. These several records, I believe, were submitted by Mr. Miller to the proper authorities for their judgment, and I heard nothing further on this particular subject for two or three weeks, during which time I continued to experiment by endeavoring to produce a record which would not break, by introducing fibrous material, first by saturating the fibrous material with the molten wax, then trying to force it into the molds, which was heated to about 300 degrees. This I found to be very impracticable. I then tried to use fibrous material in large pieces, instead of in finely divided state, such as blotting paper, strips of newspaper, strips of cheesecloth, and cotton wadding.

Q. 5. In Mr. Miller's testimony the molded masters, which you have testified to making, have been described to be made by what he calls the "hot process"; using this term to designate the process and confining yourself to master molds in which no material was used but the master wax, what work,

if any, did you do for Mr. Miller by the hot process after the first experimental work to which you have referred?

The first clause of the question is objected to as without proper basis of fact in the evidence. The question is objected to as irrelevant and immaterial.

A. I continued on these experiments.

10

Q. 6. Did or did not you thereafter make molded masters for Mr. Miller by the hot process, and if so, to what extent?

By defendant's counsel:

Defendant's counsel once for all reserves the objection to the term the "hot process" as indefinite.

A. I did make molded masters for Mr. Miller, as requested by him from time to time, according to his progress in making the molds from these masters.

20

Q. 7. What has been the history of that work since the time when you made such molded masters for Mr. Miller?

A. My experiments with the fibering process being quite promising I continued to work on it, using the same molds and also using the regular commercial molds, and introducing the different materials which seemed to be called for as the experiment progressed. I gradually worked along submitting samples to the proper authorities, until they thought it was a commercial record which would not break. During all these experiments I made, occasionally, records for Mr. Miller by this hot process. We started making commercial records in building known as No. 10, at West Orange. I employed a number of men and boys to see what could be done by way of production in a commercial way. Mr. Miller continued to call on me to mold

30

40



master records for him from mother molds from time to time. The masters made from these mother molds were used for making commercial molds. There was about two selections out of the regular list of 25 per month, which were made in this way. They were shipped out with the regular work, in order to see if any complaints would come in, or if any one was able to distinguish them from the regular work. These records proving satisfactory to the National Phonograph Company, were ordered made on a larger scale and we set apart a special kettle and apparatus for that purpose, and Mr. Shannon, who was employed by me on the fibre records, was put in charge of the master molding by the hot process. After this I had nothing further to do with it, outside of advising Mr. Shannon as occasion required.

Q. 8. I call your attention to the Miller-Pierman patents in evidence. In the patent which is numbered 726,965 I direct your attention to the following language on page 2, in lines 72 to 81, which is as follows:

"While we have designed our improved process particularly for use in connection with the manufacture of composite records of the type invented by us, it will be understood that our process can be effectively carried out in the manufacture of records or blanks made wholly of wax or wax-like material by merely omitting the preliminary winding of a fibrous material around the core as explained."

Please state whether you ever used the mold and process of this patent for making molded masters.

Question objected to as leading in form and as calling for an incompetent answer since it is a conclusion of law as to what is the "process of this patent."

A. I did.

Q. 9. Explain the relation of this work to the work which you have said you did of making molded masters by pouring molten wax into a pre-heated mold?

Objected to as incompetent.

A. I might say that the first records I made were molded masters by pouring wax into a hot mold. I afterward had a core and base which was made in one piece, constructed in such a manner with three movable pins in the base of the core, so that when the mold was placed on the base of the core, both being heated, the mold being lowered into the melted wax, resting on the bottom of the tank, the pins will be forced up through the base of the mold, forcing the mold up. The mold resting on these three pins, left an opening between the base and the mold, the wax would run in from the bottom, carrying all air bubbles to the surface. Upon raising the mold by means of a handle, attached to the core, the mold would slip back in place, thereby forming a sort of a dipper containing the melted wax, which was then chilled by either dipping in a tank of cold water, or put in a spraying apparatus, and the record extracted as before stated.

Q. 10. How long did you leave the mold, base and core in the melted wax, and what was the approximate temperature of the wax?

A. The mold being previously heated to the temperature of the wax, which was about 360 degrees, it was only necessary to put it in or leave it in long enough for the filling to take place.

Adjourned for lunch.

Q. 11. In molding records in the way just described you heated the mold, core and base, before placing them in the wax, is this correct?



A. It is.

Q. 12. Was that your invariable practice?

A. It was not.

Q. 13. Explain any other way in which you molded records with the apparatus described in your answer to Q. 9?

10        Question objected to as irrelevant and immaterial, likewise as indefinite with respect to the time when any such other ways were practiced.

20        A. By putting the assembled mold and core into the melted wax, allowing it to heat up to the temperature of the wax, when it becomes as hot as the wax, the wax would flow in the mold itself; it is then removed and treated as before. When the assembled mold, base and core are first placed in the wax, the wax would congeal on it and would not flow in until the mold became hot enough to melt the wax which had congealed.

30        Q. 14. Please state, as briefly as possible, the order in point of time in which you molded records by pouring the wax into a mold already heated; by submerging a mold in wax and allowing the wax to flow into the mold through its bottom and by placing a mold, base and core in the wax, the core having a wrapping of material around it, such as blotting paper, cheesecloth, and the like, as you have testified, and as is disclosed in the Miller-Pierman patent. By this I mean to inquire the order in which these various things were developed.

40        A. First records were cast by pouring as described, and after I received the mold which was constructed in such a way that it would open automatically at the bottom by means of pins, I used the process for putting the cold mold into the wax and letting the wax heat it. The final manner in which this work was done, up to the time we

stopped using the process of combining cotton with the wax, we heated the mold and core by suspending it in the wax from suitable hooks which prevented the mold and core from touching the bottom of the tank. They were allowed to heat to the same temperature as the wax without any wax entering the mold. They were then transferred to the molding tank and immersed in the wax; when the mold and core touched the bottom of the tank the pins would raise the mold and allow the wax to enter the heated mold. 10

Q. 15. When, if you remember, did you begin making records having cotton wool, or fibre therein?

Question objected to as immaterial.

A. I should say about six or seven weeks before applying for a patent on it.

Q. 16. And if I understand you correctly, you made molded masters or molded records by the various hot processes that you have described, that is to say, the various processes in which the hot mold is used, before the time mentioned in your answer to the last question? 20

A. I did.

Direct examination closed.

By Mr. MASSIE:

x-Q. 17. You have spoken of Mr. Miller being the mechanical man of you two, or perhaps Mr. Miller is the one who so testified. Are you the wax expert of complainant's laboratory? 30

A. I am not.

x-Q. 18. Are you familiar with the various wax-like compositions employed by the complainants?

A. I am only familiar with them in their mixed condition.

x-Q. 19. Is it the fact that complaints employ regularly three different compositions, namely, one 40



for making original records, to be engraved upon the talking machine; another composition for molding master records; and a third composition for molding the commercial record?

A. That is so.

x-Q. 20. What differences, if any, can you name as among these three compositions?

A. The principal difference is in the shrinkage.

10 x-Q. 21. Do you mean the difference in amount of shrinkage; or if in some other respect, what is it?

A. I mean the difference in the shrinkage due to the variable proportions of like materials used.

x-Q. 22. Do you mean they all shrink in the same manner, but one composition shrinks more than another and less than the third?

A. That has been my observance in practice.

20 x-Q. 23. Which of the three shrinks the most, which next, and which least?

A. I can't state positively. At the time I conducted these experiments, in comparing the master wax with the commercial wax, the master wax shrunk the greater of the two. Since that time the compositions have been improved by suitable changes and I cannot clearly state the difference at the present time.

30 x-Q. 24. And how did the wax for originals compare, at the time of your observations, with either of the other two, with regard to shrinkage?

A. I had no occasion to compare them any further than the two mentioned, as the wax used in the commercial blank cylinders was unsuitable for my use at the time.

x-Q. 25. Is it possible that you used the wax for originals in only the first one or two experiments which you reported to Mr. Miller; and thereafter used only the other two compositions?

40 A. I should say, no.

x-Q. 26. I understand, however, that you found by your experiments that the wax which you employed in the first experiment (reported in answer to Q. 4) was not suitable for the purpose, and that you afterwards tried other compositions both separately and otherwise; and that it was ultimately decided that the wax such as used for making original records was unsuitable, so that a different composition was finally adopted. Is that correct? 10

A. There were several samples of wax given to me for trial; the composition of which I know nothing about.

x-Q. 27. What were the results of your trials of the several compositions you have just referred to?

A. The results were that owing to the fact that we did not have molds which were made from records cut on a machine with the proper thread, the first records I molded shrunk to about 102 threads to the inch. It was not entirely due to the compositions used, as the wrong thread in the mold had a good deal to do with it. 20

x-Q. 28. Can you state the melting point of the composition used by you when you molded records by any of the processes set out in your direct examination?

A. I cannot.

x-Q. 29. In the course of your direct examination, for instance in answer to Q. 10, you have named the temperature of the wax as being 360 degrees, which I understand to mean Fahrenheit, did you read this temperature yourself, or how did you know what the temperature was? 30

A. In all experiments with wax, I invariably keep a thermometer in the melted wax, as should the temperature gradually rise above 450 degrees F., without my knowledge important ingredients would volatilize and thereby alter the composition.

x-Q. 30. Did you make any special note of the 40



temperature at which the wax became liquid, I will refer specifically to the first experiment reported in answer to Q. 4, where you had heated the damaged mold on a gas burner, also to your answer to Q. 10?

10 A. In practice we do not refer to the melting point of the wax. It is assumed that the melting point and the point at which the melted wax congeals is the same. Therefore, we only note the congealing point.

x-Q. 31. Did you note the congealing point in the matters inquired of?

A. I did not.

20 x-Q. 32. In your various works and experiments, in connection with molding records, where your mold was either heated beforehand, or heated by its contact with the melted wax, did you observe what relation there was between the temperature of your molten wax and the temperature at which it would congeal? That is, was the congealing point only a few degrees below the temperature of the molten wax, or was it 50 or 75 degrees below, or was it even more than that?

A. It had always been my custom in molding experiments in the hot process to use the wax at least 70 degrees above the congealing point.

30 x-Q. 33. Can you state as a general proposition whether or not that rule is observed in the factory operations of complainants; or are you speaking solely for your own personal practice?

A. I am speaking of my personal practice.

40 x-Q. 34. Do you know anything as to the practice of the processes in complainant's factory? I refer, of course, solely to the proposition that in the so-called "hot process" of molding cylinder records, the wax is in practice raised to a temperature of at least 70 degrees F. above its congealing point.

A. I do not know what is used in the factory practice.

x-Q. 35. Why have you followed the custom as to temperature, which you state in answer to x-Q. 32?

A. In my experiments with the material at hand, the results seem to be the best under those conditions.

x-Q. 36. During what period approximately were you employed by the American Graphophone Company, and in a general way, what were your duties while there? 10

A. I went to work there in December, 1896, and I left their employ in March, 1901. My duties there were to establish a duplicating process, which I developed mechanically and had complete charge of up unto the time I left their employ.

x-Q. 37. Were you familiar with any molding operations carried on at defendant's factory, either of sound records or blanks? 20

A. I was familiar with both processes, one being carried on commercially and another one experimentally.

x-Q. 38. Please describe briefly the processes carried on commercially while you were there?

A. It consisted in molding blank cylinders for use on the duplicating machine, which was practically identical with that used at the Edison Works. 30

x-Q. 39. Melted wax-like material was poured into a smooth-bored metal cylinder, having centered therein a tapering core provided with a spiral groove; and after the casting became set it was ultimately removed from the mold?

A. That was it.

x-Q. 40. Please describe briefly the experimental process referred to in answer to x-Q. 37, as carried on at defendant's factory when you were there? 40



A. This experimental molding process consisted of electroplating with copper a record, the copper shell thus produced was placed in a so-called steam jacket. There was also placed inside of the mold a core, the melted wax was then poured in to fill up the mold. The steam was then turned on and circulated through the jacket, thereby heating the mold and its contents, after which the steam  
10 was turned off and allowed to escape by suitable means and cold water was allowed to flow in its place, thereby cooling the record. The record was then removed.

x-Q. 41. Wherein did this process you have just described differ from the process carried out by you with the damaged mold, as described in answer to Q. 4?

By Mr. Dyke: Question objected to as incompetent, it being the function of this witness to describe the various things which have been done and the function of the Patent Expert to make comparisons therebetween. The witness is not qualified as a patent expert.  
20

By Mr. Massie: Defendant's counsel calls attention to Q. 9, but reframes the question as follows:

x-Q. 42. Wherein did the process that you observed at defendant's factory, and have referred to in answer to x-Q. 40, differ from the process which  
30 you referred to as carried out by you with the damaged mold?

By Mr. Dyke: Same objection.

A. The principal difference was that I heated the mold and core first.

x-Q. 43. What other differences can you name?

By Mr. Dyke: Same objection.

40 . A. I used the gas flame to heat the mold and

core; I chilled the mold and core by contact with rags wet in cold water, and I got a good record.

x-Q. 44. I call your attention to complainant's exhibits, Miller & Pierman Patent, No. 726,965, and read the following passage, beginning at line 81 of page 2:

"We also wish to lay especial stress upon that feature of our process consisting in molding a blank or record around a hollow core, having a spiral groove therein, because in this way we are able to successfully mold records or blanks having an integral internal spiral rib, and to remove the core from the finished article without injuring the latter." 10

Is this statement correct; that is, does this feature present the advantage there asserted?

A. It does, especially in combination with the wax and fibrous material.

x-Q. 45. It is true likewise when casting a record or blank composed entirely of the wax-like composition, though perhaps the advantage over other methods is not so marked as when fiber is embedded? 20

A. That is not the case.

x-Q. 46. Then is the statement quoted in x-Q. 44 true when casting records composed entirely of the wax-like composition?

A. There is no advantage in this feature, unless you use the fibre. 30

x-Q. 47. Who contributed the ideas quoted in x-Q. 44, you or Mr. Miller, or was it the joint production?

A. The idea of using a spiral thread was not originated at the time by either Mr. Miller or myself; it was taken from the regular practice of molding blanks and was considered an advantage, inasmuch as we could not gouge the grooves while the material was warm, owing to the fact that the reamer would rip out all the fibering we put in. 40



x-Q. 48. Who suggested or originated the incorporation of fiber, you or Mr. Miller, or was it a joint production?

By Mr. Dyke: Question objected to as immaterial, the Miller-Pierman patents not being in suit herein.

A. It was my invention.

10 x-Q. 49. Who originated the suggestion of having the mold at the temperature of the wax instead of being merely warm?

By Mr. Dyke: Same objection as to previous question.

A. I did.

20 x-Q. 50. At the time that Mr. Vanderway was working in the complainant's laboratory under Mr. Miller's direction, were molded records being made by complainants, in the way of regular course of business; and if so state broadly, how such records were made?

30 A. The regular commercial records, as sold to the public at that time were molded by what we term in the factory the "dipping process," which consisted in taking a slightly warm mold, I should say not above 100 degrees F., and placing it in a water jacket, the water being sealed in the jacket, which was warmed by being immersed in a tank of water suitably heated by steam coils to about 40 100 degrees. This water jacket containing the mold was placed in a receptacle called the "can," and allowed to descend slowly into the melted wax by means of an air chamber having a piston therein, the air escaping slowly, allowing the piston carrying the mold to gradually descend into the wax. It remained there, I should say, about two minutes, the time being controlled by a clock, which started when the mold began to descend and ran for a specified pre-arranged time, when it would automatically, by electrical contact, light a

red incandescent lamp, which was a signal to the operator to raise the mold out of the wax and pass it over to the next man in the crew, who looked after the extraction of the record from the mold.

x-Q. 51. In the first sentence of your answer to Q. 7 you refer to trying different materials. What classes of materials are you there referring to?

A. Various wax-like compositions, which were given to me in a mixed condition. 10

x-Q. 52. I call your attention to Q. 9, which does not seem to be directly answered. Is there any relation between the work referred to in the previous question (Q. 8) and the work you did in making molded masters by pouring molten wax in a pre-heated mold?

By Mr. Dyke: Counsel for complainants desires to explain that at the time the question referred to was asked the witness, it was explained to him off the record that the relation inquired about was intended to mean merely the relation to time and the answer which the witness gives was with this understanding. 20

The question as now put apparently calling for a comparison between the two processes and an identification of the similarities and differences is objected to as calling for an incompetent answer, as the witness is not qualified as a patent expert. 30

A. The difference is that in one case the wax is poured in the top by hand, and in the other case it entered by way of the bottom by automatically raising the mold.

x-Q. 53. You have referred to your work in connection with the apparatus disclosed in the Miller & Pierman patent, and have stated that by means of this apparatus you had molded sound records wholly of wax or wax-like materials (fiber being omitted). You have also referred to the 40



process you observed at defendant's factory, of molding sound records experimentally. What differences did you observe between these two processes?

10 By Mr. Dyke: The objection is made that this question is incompetent, since it calls for a conclusion, and the witness has not qualified as a patent expert.

By Mr. Massie: The witness is asked in the question to state what differences he observed in the actual carrying out of the two processes. He is asked for facts and the question is regarded as proper.

20 By Mr. Dyke: When the witness had finished describing the two processes as practiced, he had stated all that he knew as facts. A comparison between these things necessarily involves a conclusion and the objection must be insisted upon.

By Mr. Massie: Had the last question asked the witness to point out the differences between the disclosures appearing on the record, there might be room for the objection. The question asked the witness to point out the differences between the things he actually saw, some details of which may not be included in the answers already given.

30 By Mr. Dyke: The objection is that comparisons involve conclusions as a matter of necessity, and complainants' counsel cannot see any difference between comparing any two written descriptions of things which he saw and comparing the things described.

40 A. I firmly believe that I have stated the difference. I will state, however, that what I observed at the Graphophone works was simply pouring melted wax into the space between the mold and the core; that I did on my first experiment because

it was the handiest way to do it, of which I was aware at the time, and because it was necessary to get the wax in somehow. The method of allowing the wax to enter at the bottom was simply an improvement over the pouring method by hand in order to save time. It made no material difference in the finished product.

x-Q. 54. Would there be less tendency to entrap air bubbles if you flow the material in from the bottom? 10

A. No, providing the mold was the proper temperature.

x-Q. 55. Please compare, as well as you can, the temperature of the mold and of the wax, in each of the two instances inquired of?

A. The temperature of the wax in the Graphophone instance was not known to me, other than the fact that it was in a molten condition; the mold might have been considered slightly warm, but could not be considered hot by any stretch of the imagination. In the case of my experiments, I always endeavored to have the temperature of the mold equal to that of the wax. 20

x-Q. 56. In referring to the temperature of the mold at the Graphophone factory, which you say might have been considered slightly warm, etc., are you speaking of the temperature before the wax had been introduced and before the steam had been introduced into the surrounding steam jacket? 30

A. No.

x-Q. 57. Do you mean that after the steam had been introduced into the jacket surrounding the mold, and after the molten wax had been poured into the mold, that according to your understanding the mold could not be regarded as substantially more than slightly warm?

A. I refer to the temperature of the mold and jacket at the time the wax was poured in. 40



x-Q. 58. I understand you to mean, without referring to the temperature of the mold before the wax is put in, and without referring to its temperature after the wax and the steam have been admitted, you mean that at the very moment the wax was poured in, the mold was only slightly warm?

A. That is correct.

10

Signature and certificate waived.

March 6, 1908.

Met pursuant to adjournment.

Present:

FRANK L. DYER, Esq., for complainants.

C. A. L. MASSIE, Esq., for defendant.

20

ARTHUR S. BROWNE, a witness produced on behalf of complainants, having been first duly sworn, deposes and says, in answer to questions propounded by Mr. Dyer, as follows:

Direct examination by Mr. DYER:

Q. 1. Give your name, age, residence and occupation?

A. Arthur S. Browne, age 47; Washington, D. C.; patent solicitor and expert.

30

Q. 2. What experience have you had qualifying you to testify as an expert in reference to patents for inventions, and particularly in the phonographic art?

A. I was graduated from Dartmouth College, Hanover, N. H., in 1881, and in the following year I entered my present profession, in which I have since been actively and continuously engaged. I have prepared and prosecuted many hundreds of applications for patents; and I have made numerous investigations into the literature of various

40

arts for the purpose of giving opinions concerning the novelty of inventions, and the scope, validity and infringement of patents. I have frequently visited workshops and factories for practical information. I have frequently testified as an expert witness in patent suits, having testified in about two hundred such suits. I have been familiar with the phonographic art for about fifteen years, and I have testified in a number of suits in which phonographic patents were in suit. 10

Q. 3. Have you read and do you understand the specifications of the three patents in suit?

A. Yes.

Q. 4. Have you read the testimony heretofore taken in these suits, and have you examined the various exhibits which have been offered in evidence?

A. Yes.

Q. 5. Are you familiar with the manufacture of duplicate sound records as at present practised by the complainants in these suits? 20

A. Yes.

Q. 6. Please outline that mode of manufacture?

A. The manufacture of sound records involves the following:

(1) Making the blanks on which the sound groove is to be made.

(2) Making the sound groove in the blank.

(3) Making a master mold from this sound record. 30

(4) Making duplicate master records from the master mold.

(5) Making other molds from the several duplicate masters.

(6) Making the commercial duplicate sound records from the duplicated molds.

These duplicate records are sold to customers who use them on a sound reproducing machine to 40



reproduce the sounds which were previously recorded in the blank.

These several operations can conveniently be described under appropriate headings in sequence.

#### BLANK-MAKING.

10 A suitable blank composition is heated until it is in a fluid condition. It is a "soap composition" such as was first set forth in the Edison patent No. 430,274, June 17, 1890, (application filed July 30, 1888), this being subsequently developed to furnish the soap composition now used. This melted soap composition is poured into the cylindrical space between the mold and its core substantially as illustrated in the Edison patent No. 414,761, November 12, 1889, (application filed August 10, 1889), as here illustrated, the outer cylindrical mold has a smooth interior surface, and  
20 the core has a spiral groove. When the material poured into the mold is still in a soft and semi-plastic condition, the cylindrical outer mold is pulled off, and the spirally threaded core is unscrewed. This leaves the blank with a rough outer surface, while the interior has a spiral rib as illustrated in Fig. 2 of this Edison patent No. 414,761. On account of the rough outer surface, the molded blank is unfit for immediate use. When cold, its  
30 outer surface is shaved off by means of a small lathe, so as to leave the exterior surface perfectly smooth and cylindrical. Also the interior spiral ribs are shaved so that they may exactly fit the rotating mandrel of the sound recording machine. The soap composition of which this blank is made is of a character to be readily grooved in the sound recorder.

#### RECORDING SOUNDS.

40 The blank is then placed on the mandrel of the sound recorder or phonograph, and a popular singer, speaker or well-known band performs in the

vicinity, with the result that music or speech is recorded in the blank. The fundamental characteristics of the sound recorder are those disclosed in Edison's original phonograph patent No. 200,521, Feb. 19, 1878, (application filed Dec. 24, 1877). As here shown, a rotating cylinder or mandrel A, carries the surface in which the sound record is to be made, and in the vicinity is a diaphragm or membrane B, which is set in vibration by sound waves and which carries a stylus which makes a sinuous record in the blank. As the mandrel rotates, it moves lengthwise, so that the resulting sound groove is a spiral around the blank and sinuous, or up and down with respect to its surface. These fundamental principles are those of the modern phonograph, of course, much improved in detail during the years which have intervened; the sound groove being now cut or plowed out by a cutting or engraving stylus, which plows through the soap composition of which the blank is composed; and the stylus, with its diaphragm traversing lengthwise of the mandrel instead of the mandrel moving endwise, as described in Edison's British patent, No. 1644, April 24, 1878. The result is to cut a spiral groove in the surface of the blank, this groove having up and down undulations, depending in shape, depth and frequency upon the character of the sounds produced in its vicinity.

This sound groove is of delicate character. The groove is less than one one-hundredth part of an inch in width and its variation in depth is still smaller. Yet, the faithful reproduction of the impressed sounds demands that there should be no disturbance of this sound groove.

This "master" record can be used directly for reproducing sounds, but is unsuitable because its soft characteristics which render it easily cut re-



sult in it being quickly worn out by repeated use in the sound reproducing machine. As the phonograph business is now developed, its chief use is for entertainment and amusement, and hence a large number of duplicates must be readily and economically made. The artist who is engaged commands a large remuneration for a single song, and if only one sound record could be made for a single singing, the expense would be prohibitory. The other steps of manufacturing have to do with the making of duplicates of this record.

#### MOLD-MAKING.

A cylindrical metal mold is made from the master record by an electro-plating and typing operation, so as to produce a metal mold like that shown in "Complainant's Exhibit, Commercial Joyce Apparatus." An inspection of this mold shows it has on its interior surface irregularities forming the sound grooves in the master records, except that they are just the reverse, there being projections in the metal mold, where there are depressions in the master record. The process of making this metal mold involves the destruction of the master records, which is broken in pieces, in order to get it out.

#### MAKING DUPLICATE MASTERS.

The master mold just described might be directly used for making commercial sound records for the market. This would, however, be too slow, since only one duplicate could be made at a time; and, moreover, as common workmen are employed in making the duplicates, if there were but this single master mold, any injury to it would undo all the previous work which has involved the original expensive artistic performance. Accordingly, the procedure is to make a sufficient number of "duplicate master" records from the master mold, special care and attention being given to this opera-

tion to avoid injury to the master mold, which is then carefully preserved for further use in case of need. As many duplicate masters are made, as the assumed popularity of the composition demands, a dozen being a customary number. These duplicate masters are made in accordance with the Joyce patent in suit, No. 831,668, September 5, 1906, (application filed October 13, 1897). For this operation there is an interior core and attached bottom, as shown in "Complainant's Exhibit, Commercial Joyce Apparatus," and a detachable cap ring in addition to the metallic master mold. These parts are heated in a small gas furnace. The proper temperature is determined by the attendants in a crude way by moistening the finger and by touching the exterior surface of the mold in just the same way that a woman tells whether her flat-iron is hot enough. On one occasion, I, myself, endeavored to ascertain the temperature by stopping the attendant just before he was going to fill the mold and inserting a thermometer into the space between the mold and the core. The thermometer indicated 249 degrees F. As it took several minutes for the thermometer to reach its highest point, there would probably have been some cooling of the mold, so that a minimum estimate of 260 degrees F. for the working temperature would be about right. The mold being thus heated, the record composition is dipped from its molten bath and is poured into the mold. The composition is substantially the same as that used for making the commercial records, and is, I understand, substantially the composition of the Aylsworth patent No. 782,375 of Feb. 14, 1905, (application filed November 3, 1903). This composition presents a much harder surface than the blank composition, so that it can resist wear for a long time, so that a sound record made therefrom can be used for a great many successful repetitions.

10

20

30

40



After the composition has been poured into the mold, the mold is dipped into cold water, where it is allowed to remain for a short while. While the molten material is still in a soft semi-plastic condition, the mold is removed from the water; the core is pulled out, the cap ring is removed; the surplus material which was within the cap ring is cut off; and the interior is reamed out to the proper size and shape. This reaming out of the interior is done while the record material is still warm and within the mold, as is set forth in the other two patents in suit, Nos. 683,615 and 683,676, both of October 1, 1901, except that no concentric ribs are formed on the interior, since these duplicate masters are not intended for use on a sound reproducer. The metallic mold with the warm duplicate record still within it is then placed within a cooling jacket through which cold water circulates, the hollow interior of the enclosed record fitting over a metallic supporting sleeve. The cooling continued until the duplicate record has shrunk away from the interior irregular surface of the mold. The mold is then lifted endwise off; and the duplicate record still on the interior supporting sleeve is then placed to one side until thoroughly seasoned, when it is removed from the supporting sleeve and is ready for further use.

As many of these duplicate masters are made as are necessary, say a dozen for an ordinary performance.

#### MAKING DUPLICATE MOLDS.

The dozen duplicate masters are then used for making as many duplicate metallic molds. These are made just the same way as original or master molds; the making of each duplicate mold involving the destruction of the duplicate master record, which has to be broken to get it out. As a result of this operation, a dozen duplicate metallic molds

with sound irregularities on the interior of each are made, all being just alike.

#### COMMERCIAL SOUND RECORDS.

With this dozen metallic molds, the commercial sound records are produced in large quantities for the market, all with the same song, speech or instrumental music impressed therein. These duplicate commercial records are made in substantial accordance with the method set forth in Miller & Aylsworth patent in suit, No. 683,615, Oct. 1, 1901, (application filed July 31, 1900). This patent has already been so fully explained by three different witnesses that it is unnecessary for me to say anything further. By this mode of procedure duplicate sound records are turned out in large quantities and as most of the steps are such as can be performed by unskilled workmen, they can be profitably sold at a low price.

10

20

Each duplicate record is hard and durable; it has on its exterior a perfect reproduction of the sound groove of the original master record, so that it can reproduce the music with the same faithfulness as an original master record; and its outer surface is perfectly cylindrical so as to co-operate to the best advantage with the sound reproducing machine, while its interior with its concentric rib exactly fits the reproducer, and is exactly concentric with the cylindrical surface. All this is secured with the minimum quantity of material, since the internal concentric ribs alone contact with the mandrel of the reproducer and the rest of the record is reamed out as far as the ultimate desired strength permits.

30

#### SOUND REPRODUCTION.

The sound reproducing machine is substantially a duplicate of the sound recording machine except that it does not have a cutting style, but a rub-

40



bing style which tracks in the sound groove without removing any of the material. This reproducing style is made of a jewel, such as sapphire as set forth in the patent of Edison, No. 484,584, October 18, 1892, (application filed May 27, 1890), this having the requisite smoothness, the hardness to resist wear and not being affected by moisture or the material of the sound record.

10 The steps necessary, therefore, to get the commercial records ready for the market are elaborate and those which the exigencies of this peculiar art demand.

Q. 7. Please trace the history of the art of recording and reproducing sounds preceding the filing of the application of the Joyce patent in suit, October 13, 1897, so far as the same may be material in showing the important steps taken?

20 A. The art originated with Mr. Thomas A. Edison, who in 1877 made the first machine capable of recording and thereafter reproducing sounds. This machine he called the "phonograph" and it is described in his patent, No. 200,521, February 19, 1878, as stated in the preceding answer. In this machine the recording is done through the indentation of tin-foil by means of the sound vibrating stylus; and the reproduction was done on the same machine without any intervening handling of the tin-foil,  
30 except the restoration of the mandrel to the starting point. Few inventions have created the widespread interest which followed this invention of Mr. Edison. It was a sufficient marvel that sound could be reproduced at all. Experience, however, with the original phonograph demonstrated that tin-foil was an unsuitable recording material, and that indentation was an inadequate method. In spite of its pliability, the tin-foil was distorted during the indentation; successive reproduction soon pro-  
40 duced additional distortion so that sounds soon be-

came unrecognizable; and the tin-foil could not be successfully removed from the machine on which it was indented for subsequent use on another machine.

Accordingly, effort was directed toward the production of a suitable recording material and the proper way of getting the sound record in it.

The first important improvement in the art is set forth in the patent of Bell & Tainter No. 341,214, May 4, 1886. This describes a sound record blank composed of a foundation of pasteboard, with a surface coating of beeswax and paraffine; this composition being referred to as "wax-like" to identify its characteristics. This patent also describes the cutting or engraving method of making sound records by engraving or cutting out the material of the blank by a cutting or engraving style vibrated by sound waves. This cutting or engraving method is the one which has since been commercially used.

The Tainter patent No. 341,288 of May 4, 1886, illustrates the modern form of recording and reproducing machines, in that the recording and reproducing style moves endwise of the blank or sound record during its rotation, as in Edison's British patent No. 1644, April 24, 1878; and describes the customary relation between the style and the record surface in order that the reproducing style may "track" or follow the sound record.

The Edison patent No. 414,761, November 12, 1889, shows the molding of the blanks to be used for recording purposes.

The Edison patent No. 430,274, June 17, 1890, describes the blank composition as being a "soap composition," the improved and modern soap compositions being the outgrowth of this original suggestion.

The Edison patent No. 484,584, October 18, 1892, describes the jewel reproducing style.



The importance of duplicating the sound records was early appreciated. In Mr. Edison's British patent upon the phonograph, No. 1644, April 24, 1878, several plans are suggested for making duplicate records. The plan which was commercially used prior to the application of the Joyce patent in suit was embodied in these early suggestions. As shown in Fig. 59 of this British patent, (describing beginning at line 18, page 10) one indented sound record was to be used for indenting a blank through intervening mechanical duplicating devices. This was the principle of duplication which was commonly employed prior to the invention of the Joyce patent in suit. Such mechanical duplicating apparatus is shown in the patent to Macdonald No. 559,806, May 12, 1896, (application filed December 4, 1895). There is shown in this patent two parallel, equally rotating mandrels, one of which has a master record with a sound produced groove in it, and the other has a blank on it. Connected by suitable mechanical connections are a reproducing style which follows the sound groove in the master record, and the cutting style which cuts a corresponding sound groove in the blank. This method of mechanical duplication was that which was practically employed prior to the Joyce invention. In fact, this patent of Macdonald (who I understand, has testified as a witness in this suit on behalf of defendant) shows that just prior to the Joyce application, inventors were still at work trying to improve mechanically duplicating machines. Such mechanical duplication is inefficient, since it rapidly wears the master record, and the duplicate records must be made of material soft enough to be readily cut and hence lacking in durability and not susceptible of a great many repetitions.

The Joyce patent in suit contains the first disclosure in the art of a practicable method of mak-

ing duplicate sound records by a casting operation.

Q. 8. In your last answer you have referred to Mr. Edison's British patent of 1878, containing several suggestions as to the duplication of sound records. Please refer to these suggestions; and also state if between that date and 1897, when the application for the Joyce patent in suit was filed, there was any other suggestion made in patents for duplicating sound records?

10

A. In addition to the mechanical duplication suggested in Mr. Edison's British patent No. 1644, April 24, 1878, it suggests other plans.

One suggested plan is to obtain a metal cylinder by an electro-type process from the original master for the record, this cylinder having the sound irregularities on its exterior. The suggestion then is to use this in connection with an opposing roller to indent "strips or sheets of foil or rollers to produce copies." This is described at lines 24-27, page 10, and is illustrated in Fig. 60 of the drawings.

20

Another plan is to use a similar roller of metal with the sound irregularities on the exterior surface "so as to knurl or indent" the phonogram in a roller 43 of soft metal that is to be pressed against the roller 42 that has the sound irregularities; as shown in Fig. 61 and described at lines 28-30 of page 10.

Another suggestion is to make a split or divided mold, shown in Fig. 62, with the sound irregularities on its interior, duplicates to be made by filling the mold with Plaster-of-Paris when moist, the mold being opened when the Plaster-of-Paris is dry to permit it to be removed. The duplicate record would thus be a Plaster-of-Paris cylinder. This is described at lines 30-35, page 10.

30

It was also suggested that after making a metallic reproduction by electroplating, such metallic re-

40



production can be "used for impressing strips or pieces of metal" (page 10, line 48).

All or nearly all of these suggestions have given rise to numerous attempts to carry them out by different inventors.

Mechanical duplication, either through direct mechanical connections or pneumatically is set forth in the following patents:

10

Douglass No. 475,490, May 24, 1892.

Bettini No. 488,381, Dec. 20, 1892.

Amet No. 539,212, May 14, 1895.

Amet No. 545,439, Sept. 3, 1895.

The Tainter patent No. 341,287, May 4, 1886, suggests the making of a duplicate record in metal by electroplating.

20

The Edison patent No. 484,582, Oct. 18, 1892, (application filed Jan. 5, 1898), is a development of the divided mold as suggested in the British patent of 1878. It obtains a cylindrical metallic mold through an electroplating process, and then splits it longitudinally "by a very thin saw into a number of parts—say, for illustration, three parts—which are suitably mounted upon levers, so that a mold is formed which can be closed to receive the material to be molded and opened to permit of its being taken out." (Page 1, lines 69-75.) This split mold is then to be used as follows:

30

"The duplicate phonograms are produced by means of this mold by pouring therein and preferably around a suitable core placed in the mold, suitable substances, such as wax, or wax-like material, resin, or Plaster-of-Paris, the material being preferably too hard to be satisfactorily indented by the phonograph, or the duplicate phonograms may be made by taking sheets of smooth material, like waxed paper or tin-foil and pressing them upon the surface of the mold by a plunger or otherwise, the sheets

40

being afterwards backed up by a wax, resin, or cement." (Page 1, lines 75-88).

This plan is wholly impracticable. It is impossible to make a satisfactory sound record in a split mold. The splitting of the mold necessarily involves the removal of some of the metal containing the sound record, thus destroying some of the sound waves, and the molding of the material in such a mold inevitably results in fins or burrs in case the material is in condition to fill the very fine irregularities which constitute the sound record. 10

I call especial attention to this patent because I shall refer to it later.

The Edison patent No. 382,419, May 8, 1888, attempts to carry out the knurling suggestion of the 1878 British patent. In accordance with this, through electroplating a flat metal surface is to be obtained, having the sound record thereon, and over this is to be rolled under pressure a wax-like blank to receive an impression of the sound record. 20

Herrington No. 399,264, March 12, 1889, proposes to make duplicates by impressing tin-foil backed up by a softened material against an indented tin-foil record.

Herrington patent No. 399,265, March 12, 1889, proposes a knurling operation resembling that of the Edison patent No. 382,419.

The Lioret patent, No. 528,273, Oct. 30, 1894, proposes to make celluloid duplicates. A metallic matrix cylinder or mold is formed by electroplating from a master record. A celluloid sleeve is then introduced inside, and mold and celluloid are then plunged in the hot water so as to soften the celluloid, which becomes plastic at about the temperature of boiling water. A mandrel is then inserted inside the celluloid ring, so as to forcibly expand the then plastic celluloid and force it into intimate contact with the inner sound groove or surface of 30 40



the matrix cylinder or mold. The mold and celluloid sleeve are then plunged into cold water and the specification says that the celluloid thus "recovers its hardness and is at the same time generally contracted sufficiently to permit the easy withdrawal of the ring C from the mold A' by unscrewing it therefrom. If, however, the contraction of the ring C in this way is not sufficiently greater than that of the mold A,' the mold may be slightly warmed by heat externally applied." (Page 2, lines 108-115). It will be noted that Lioret does not get sufficient separation to slip the celluloid duplicate out endwise, but only sufficient to free the two, so that the celluloid duplicate can be unscrewed from the mold, the unscrewing being permitted by the spiral character of the sound record.

The British patent to Young No. 1478 of Jan. 23, 1894, describes a process similar to that of Lioret, except that Young apparently found that the celluloid sleeve could not be removed from the mold by unscrewing, since he describes using a very thin celluloid sleeve, so that (after the sound record has been made in it by pressure) it can be collapsed or bent so that it can be withdrawn from the mold.

These instances show that numerous attempts were made prior to Joyce to get duplicate records, and that the importance of doing so was widely appreciated. Yet, the ultimate outcome of the endeavors of the inventors prior to Joyce is exhibited in the Macdonald patent No. 559,806, May 12, 1896, which sets forth an improved form of a mechanical duplicating machine.

No one prior to Joyce had suggested making duplicate records by casting molten wax-like material in a heated continuous unbroken mold, the wax-like material being of a character which would shrink away from the mold on cooling without injuring or distorting the perfection of the sound record cast

in it, such shrinkage permitting the endwise separation of mold and finished record.

Q. 9. Mr. C. A. L. Massie, defendant's expert, as I understand him, finds no novelty in the subject matter of claims 3, 4 and 6, of the Joyce patent in suit No. 831,668, in view of the prior state of the art, discussed by him. Please state whether or not you agree with Mr. Massie, giving your reasons.

A. I do not agree with Mr. Massie.

10

In preceding answers I have already considered all of the patents earlier than the Joyce application relating to the phonographic art, which have been discussed by Mr. Massie, with the exception of the Edison patent No. 382,462, May 8, 1888, which simply describes a blank said to be made by molding, but containing no suggestion of how the molding was done. Possibly it was done in the manner described in Edison patent No. 414,761, Nov. 12, 1889, to which I did refer.

20

So far as the phonographic art is concerned, there is nothing to even cast a doubt upon the substantial novelty of the process of the Joyce patent in suit, as the same is defined in claims 3, 4 and 6. The history of the phonographic art shows that from its very beginning, in 1877, and throughout the period of 20 years following until Joyce filed his application in 1897, numerous inventors in the phonographic art were struggling with the problem of getting duplicate records, and that the mechanical duplicating machines were the outcome. The Joyce invention represents a turning point in the art. Practically, the old method has been superseded, and commercial duplicate records are today made by casting molten material in a continuous mold.

30

It remains, therefore, only to consider what bearing, if any, the instances in extraneous arts have to which Mr. Massie refers.

On exploring the fields of other arts, having

40



nothing to do with the reproduction of sounds, and apparently foreign and remote thereto, numerous plans will be found for making articles having varied or irregular or ornamental contours.

10 A common plan is to have a mold or die with the reverse of the desired configuration and to press or force the material into the mold or die. This is the method commonly employed when extreme delicacy is required in their production. For example, this method is employed in the stamping of coins, which in classical times were frequently cast. As the surface to be reproduced in a sound record is of extreme delicacy, minute variations being of vital importance, it would seem *a priori* probable that this would be an effective method of making duplicate sound records. In fact, this method was suggested in Mr. Edison's British patent of 1878, the "knurling" process therein suggested by him consisting in the forcing or pressing of material against a hard surface having a reproduction of the sound record. Numerous other attempts in the same direction are shown, among the instances which I have cited in the next preceding answer, such being the proposed plans of the Lioret patent No. 528,273 and of the Young British patent of 1894.

30 Probably the best known and most universally employed method of making articles with irregular contour is by casting in a mold, the completed articles being removed by destroying the mold. This is the common way of making iron castings. The mold is commonly made of sand, shaped around the pattern and in various sections. The mold sections are then brought together, the molten metal is poured in; and after the cast is completed, the sand mold is destroyed, thus exposing the cast article. This involves the destruction of the mold for each article cast; and, obviously, is wholly inapplicable to the production of duplicate sound records, since

40

the mold must be used over and over again, if there is to be any utility in the process. So far as I am aware, no one has ever proposed to make duplicate sound records by this process which is the most common of all in the art of making duplicate articles.

Another exceedingly common plan of making articles of irregular contour is by the use of divided or split molds, which can be used over and over again and when the temperature or other characteristic of the material to be molded is such as not to endanger the mold. This is the plan commonly employed when castings are to be made of soft metals, like lead, and alloys in which lead is an element. Glassware is made in the same way, particularly when the flow of glass is aided by blowing. Lettering on glass bottles is thus produced. Evidently, this method is so common that it could not have escaped the attention of those desiring to make duplicate sound records. Attempts to use such method are shown in the Edison British patent of 1878, which suggests making a Plaster-of-Paris cast in a split mold; and in the Edison U. S. patent No. 484,582, Oct. 18, 1892, which also suggests the use of a split mold. I have already commented on the impracticable character of any such plan for making duplicate sound records.

Manifestly, the making of a sound record by *pressure* is not applicable to materials which must be rendered fluid before they can effectively conform to the sound record surface, nor can casting in a mold which must be destroyed, nor in a divided mold, be feasibly carried out.

But, so far as I am aware, or so far as the record discloses, these were the only known ways in the art of making duplicate articles having irregular surfaces or contours produced as the result of the casting, molding or pressing methods.

10

20

30

40



It is significant that in no art to which reference has been made by Mr. Massie, is there any instance prior to the Joyce application of casting any article whatever in a continuous mold having an irregular unsymmetrical molding surface; and, especially is there no instance in any art where the material for the duplicate is brought to a molten condition and the mold itself is hot, when the molten material is free to flow into all of the irregularities of the mold which are to be faithfully reproduced.

Adjourned until 10 A. M. March 6, 1908.

March 7, 1908.

Met pursuant to adjournment.

Present:

Counsel as before.

The examination of the witness ARTHUR S. BROWNE is continued by Mr. Dyer. The witness here continues his answer to Q. 9.

But, Mr. Massie refers to patents and publications describing the molding of candles and of inking rollers for printing presses, which are heated and into which the material to be molded is introduced in a molten condition. It is significant, however, that in making candles and inking rollers, the interior of the mold is always smooth, and no attempt has ever been made to use a mold having an irregular unsymmetrical molding surface for the purpose of making a candle, or an inking roller with an irregular unsymmetrical surface. On the contrary, it is important in both the candle and inking roller art that the candles and rollers should have smooth symmetrical outer surfaces. The molding of candles is a great antiquity. Groves & Thorp (Vol. II., page 69) state that "*Mold candles* are said to have been introduced by the Sieur de Brez, in the

fifteenth century." Although, this art is thus nearly half a thousand years old, nevertheless, Mr. Massie has not referred to a single instance wherein the known methods of molding candles have ever been utilized for the molding of articles which are to have irregular unsymmetrical surfaces. The obvious inference is that the conditions surrounding the molding of candles are such as to inevitably lead any experimenter away from the attempt to use such matters where irregular surfaces are to be obtained as a result of molding. Manifestly, the art of molding candles is remote and foreign to the art of reproducing sounds; and the circumstance that five hundred years' experience in molding candles has never resulted in obtaining a molded irregular surface in any art, would *a priori* have prevented any experimenter from attempting to use candle methods. Moreover, the history of the phonographic art shows that candle-making never did suggest any improvement in making sound records, although for twenty years an efficient plan was actively sought.

A brief consideration of molding candles will show its utter incapacity to suggest any available steps in making sound records. In considering the making of candles I will refer not only to the patents and publications mentioned by Mr. Massie, but will also refer to other authorities. Mr. Massie has referred to the following publications:

Groves & Thorp, Chemical Technology, 1895.  
The Scientific American Cyclopedia 1893,  
Soaps and Candles, Jas. Cameron, 1896.

In addition, I will refer to the following publications:

Brannt, Manufacturer of Soaps and Candles, 1888;  
Carpenter, Soap and Candles, 1885;  
Ott, Soap and Candles, 1867.

10

20

30

40



The various publications and patents on candle making show the impossibility of utilizing the same method for all sorts of candles. Some candles can be molded and others can not. Those candles which can be molded require different treatments, depending upon the material employed. Moreover, the molds have special characteristics which would be impossible in molding sound records.

10 Referring to the characteristics of the molds, Ott says (page 161) :

"For moulding, besides the common metal molds (a mixture of tin and lead), molds of glass are sometimes used. The former are slightly tapering tubes, varying in length and dimensions according to the size of the candle to be manufactured, and, when required, are arranged in regularly perforated wooden frames or stands, with the smaller end downward, forming the upper or pointed part of the candle."

20

As here stated, the metal molds are made tapering, which obviously facilitates withdrawal as well as giving a desired shape for the candle. Manifestly, a tapering mold which will facilitate withdrawal is an impossibility in making duplicate sound records, since the mold must conform to the original master records, and that is a cylinder.

Also, Brannt (page 587) says:

30

"The molds are narrow, somewhat conical, tubes, highly polished internally, in order to impart a smooth surface to the candle. They are bored out by machinery, so that the interior shall be perfectly true \* \* \*. The molds made in this country are of a better form, and they are burnished by a vertical instead of a rotary motion, which makes the candles easier to remove."

40

Thus, it appears that ready removal of the candles is dependent not only on the tapering or

conical form of the mold, but also upon the polished interior thereof, so much so, that a difference is appreciable in favor of polishing up and down, instead of around and around. Manifestly, no such burnishing up and down is available for the inside of a sound record mold to facilitate the removal of the cast record, since the essence of the mold is that it should have an irregular molding surface corresponding to the original irregularities of the master record. The teachings of the candle molding art with respect to the molds are, hence, such as to suggest its total unavailability to making duplicate sound records.

10

I have already stated that in spite of five hundred years of molding candles, nevertheless there are some candles which even now cannot be molded. Groves & Thorp, referring to the early use of candle molds, (Vol. II., page 69) says:

"Wax does not lend itself to molding, hence the process was applied to tallow alone." This same treatise referring to the Binn's machine of 1801, (page 80) says:

20

"A somewhat strange claim of Binns in connection with this apparatus is his asserting its applicability to the manufacture of beeswax candles, which, in effect, lend themselves most reluctantly to machine production. Possibly the wish was father to the thought, that in the contrivance for applying alternate heat and cold to the molds, the beeswax might show itself readier of extraction therefrom. Be this as it may, even with the machines of to-day beeswax cannot be molded satisfactorily, and the means and appliances for this branch of the candle-maker's art are the same now as they were 200 years ago or more."

30

Other authorities refer to the same fact. Brannet (page 618) says:

"Wax having the property of greatly shrink-

40



ing after cooling and tightly adhering to the walls of the mold, is not a very suitable material for molding. In fact, the molding of wax-candles is now rarely, if ever, performed, but if executed is done in precisely the same manner as prescribed for stearine and paraffine candles."

Cameron (page 269) says:

- 10 "Wax is not well adapted for molding, on account of its tendency to adhere to the mold, and its great contraction on cooling."

Carpenter (page 278) says:

"Pouring is used only with wax candles which cannot be molded for the candles refuse to leave the molds, or crack while doing so."

- 20 According to these authorities, wax has a peculiar behaviour. Although it shrinks in solidifying, yet it seems that it shrinks in a peculiar manner, since it tends to cling to the interior of the mold and away from the center, where the wick is located—it being usual in molding candles to have the wick in place centrally within the mold and the candle material, being poured around it. Wax does not appear to be the only candle material which acts in this unexpected manner, since Brannt in describing the molding of spermaceti and paraffine candles (page 616) says:

- 30 "The moulding is executed in essentially the same manner as stearine candles, only the spermaceti must be so hot, about 140° F., that the portion congealing on the sides of the mold, the first moment on pouring in the mass, becomes again fluid. In cooling spermaceti contracts to such an extent that deep cavities are formed around the wick, which have subsequently to be filled up."

- 40 Although the spermaceti molds are externally chilled, nevertheless the spermaceti in contracting

shrinks outwardly toward the mold and away from the wick requiring subsequent refilling around the wick.

Indeed, I fail to find in any of the literature which I have examined concerning candle-making, any intimation whatever to the effect that any candle-making material would in cooling, shrink radially inward away from the mold so as to facilitate easy removal. On the contrary, the descriptions all infer a forcible expulsion, and special constructions of the mold (such as tapering form and lengthwise polish of the material) or special manipulation to get the chilled candles out. For example, Groves & Thorp (Vol. II., page 81) speak "of *ramming* the candles out of the molds"; at page 82, they speak of "*forcing* the candles from the moulds"; and at page 87, they say:

"Consequently the candles from such molds as did not obtain sufficient variation of temperature, were *difficult to expel* and not so satisfactorily made as those which had been properly treated—that is to say, particularly candles made from paraffine, since stearine candles,"

Other authorities use similar expressions. For example, Brannt (page 593) says:

"The candles being *forced* from the molds by the rammers are immediately secured and held stationary by depressing the lever G \* \* \*."

Other expedients have been tried in getting the molded candle out. Brannt (page 609) says:

"To effect an easy removal of the candles from the molds, A. Royan has constructed a machine shown in Figs. 141, 142, and 143, which conducts cold and warm water to the walls of the molds, the former for the purpose of quickly cooling the material in the molds, and the lat-



ter for the easy removal of the candles from them."

\* \* \* \* \*

10 "After the molds are wicked, the melted candle material is poured in and cooled by conducting cold water through the pipe Q. The cold water is then shut off, and after discharging that contained in the mold-carrier J through the cock T, hot water is admitted by a turn of the crank O, whereby the metal-molds K quickly expand. If, now, by a turn of the crank E, the cross bars C with the wicks fastened to them are raised up, the candles are removed from the molds."

In other words, after the candle has been chilled, the mold is again heated to expand it away from the candle, in order to get the candle out.

20 If it is desired to get a candle of polished appearance, Carpenter (page 281), says:

"A polished appearance is given to the candles by alternately admitting hot and cold water into the water box; the adjustment of the temperature is an operation needing special experience, the men's fingers forming usually their only thermometer."

30 Depending upon the material, the time required appears to vary widely. Groves & Thorp (page 79, Vol. II.) says that the molding machines "can give up a couple of dozen pounds of candles per turn-out, two to three times an hour, until the supply of wick is exhausted"; thus indicating the time as from twenty to thirty minutes.

On the other hand, in describing the molding of tallow candles, Cameron (pages 265 and 266) says:

40 "The molds are generally made of pewter, carefully polished inside \* \* \* The melted fat is poured in, generally by a small can or jack, Fig. 50, and it is essential that the

tallow should completely fill the mold which is of course maintained in an upright position. The candle must remain entire on cooling without any cracks, and should readily be removable from the mold. These results can only be attained when the fat at the sides cools more rapidly than that in the interior, and a rapid cooling is always necessary to prevent contraction of the candle. \* \* \* If the tallow is too hot, when poured in, the candles are apt to stick, and are difficult to draw; if too cold the candles are not uniform in appearance, but become granular looking. The candles are ready to be taken out of the molds on the day after casting, and then only require cutting and trimming at the base."

10

This operation requires hours. As stated, rapid cooling is necessary "to prevent contraction" of the candle; the inference being that with tallow it would contract if not rapidly cooled while such rapid cooling insures maintenance of contact between candles molded thus insuring that candles shall be the shape of the mold.

20

This literature concerning the candle molding art shows that it is not universally applicable to candle materials; that variations have to be made depending upon the material; and that a chief problem is to get the candle out of the mold, to which end a tapered form is important, and the mold must be highly polished on its interior (preferably lengthwise) to aid removal and even then force is required to expel the finished candle.

30

Not only is the literature silent as to the possibility of getting an irregular unsymmetrical outer surface, but the teachings are that it would be impossible to utilize the candle molding methods in case a cylindrical mold with an irregular molding surface were employed for the purpose of casting articles which should have a corresponding irregular outer surface.

40



Certainly the candle-molding art does not contain an unmistakable disclosure of a process like that set forth in the Joyce patent in suit, and defined in claims 3, 4 and 6 thereof.

The candle-making patents referred to by Mr. Massie do not shed any additional light on how to successfully make duplicate sound records.

10 The British patent to Humphrey No. 454, August 22, 1856, simply describes a concededly old method of making candles and asserts novelty only in applying the old method to making paraffine candles. It describes no step or method not fully set forth in the publications to which I have referred.

20 The same is true with respect to the Cowles patent No. 86,059, Jan. 19, 1869, which is simply directed to making each mold in two parts, which can be separated from each other, each section being tubular, in order that a candle may be made slightly larger at an intermediate point than at its opposite ends. It is significant that the only reference in the candle making art which involves making a candle bigger at the middle point than at its ends, sets forth a sectional mold for the purpose, the section plane being at the point where the large dimension occurs.

30 The Fournier patent No. 545,256, Aug. 27, 1895, contains no additional relevance. It refers to alternately applying hot and cold water (page 1, line 80) such as has long been practiced for making polished candles.

40 The making of inking rollers for printing presses discloses nothing tending to show the applicability thereof to making sound records. Such inking rollers are commonly made of a mixture of glue and molasses and are soft and "tacky" when ready for use, in a printing press. The essential characteristic is that the printing roller should be perfectly smooth and cylindrical on the outside. So far as

the patents referred to (Bingham, No. 182,547, Sept. 26, 1876, and Bingham No. 419,914, Jan. 21, 1890) are concerned, it would appear that force was necessary to get the finished roller out of the mold, since the only reference to this subject is near the bottom of column 1, page 2 of the early Bingham patent, which says that "the rollers drawn from or forced out of the mold" is the final operation. These patents contain no suggestion that there is any shrinkage away from the mold, which involves no distortion of the rollers, and they are wholly silent as to the possibility of utilizing the method to make any article with an irregular surface, much less that the method could possibly be useful for duplicating sound records. 10

Mr. Massie also refers to the Appelt patent No. 303,970, Aug. 26, 1884, for making drawing rollers, used in spinning machines for making thread. Such drawing rollers frequently have elastic surfaces of rubber, their purpose being to act upon slivers or rovings of cotton, wool or other fibers, so that by using pairs of rollers successively faster driven, the roving can be drawn out or extended in length and be thus brought to the suitable dimension for the twisting or spinning operation. Appelt proposes to make the drawing rollers of a fusible compound composed of gelatine glycerine, and other more secondary ingredients (page 1, line 15). Of course, such a roller should be cylindrical and should not possess an irregular or unsymmetrical surface. Appelt does suggest that this particular elastic compound (which is soft when in use) will shrink away from its mold on cooling so as to be readily withdrawn, but there is no intimation that any such action would take place in connection with materials suitable for duplicate sound records, or that the contraction would be of sufficient extent to permit the withdrawal of the sound record, or that its 20 30 40



longitudinal shrinkage shall be in such manner as not to distort the record. It is needless to add that the making of soft drawing rollers for spinning machines is a wholly unrelated art for making duplicate sound records hard enough for sound reproduction.

10        These are all of the items in the prior patented or published art earlier than the Joyce application to which Mr. Massie has referred. The entire arts fail to show any instance prior to Joyce of casting a liquid material into a continuous mold having an irregular molding surface, to which the finished casting is to conform.

20        In making duplicate sound records, it is essential that the sound record irregularities should be faithfully reproduced to the minutest detail. Even if it be assumed that it was part of prior knowledge that the record material would shrink sufficiently in cooling so as to clear the mold to permit end-wise withdrawal, it could not be affirmed or assumed *a priori* that such a method of casting would be either feasible or possible. When a material shrinks, it shrinks in all directions. If it shrinks within a cylindrical mold, it shrinks longitudinally as well as radially. These relative shrinkings would be proportional to the dimensions. If it be assumed that the thickness of the molded record when cast in the mold is  $\frac{1}{4}$  of an inch and its  
30        length is  $4\frac{1}{2}$  inches (which are closely the measurements of "Complainant's Exhibit, Commercial Joyce Apparatus") the lengthwise shrinkage would be eighteen times that of the radial shrinkage. It is difficult to see how any predictions could be made that this lengthwise shrinkage could take place with the material occupying the irregularities of the mold, without an incident distortion. There was nothing in the literature of the art shed-  
40        ding any light on this subject, and the possibility

of doing so could be determined only by trying.

I fail, therefore, to find anything in the prior art of sound reproduction, or in any of the other arts referred to by Mr. Massie, which negatives the novelty of the process of the Joyce patent as defined in Claims 3, 4 and 6 of his patent. He was the first who ever cast molten material suitable for sound reproduction into a continuous mold having sound irregularities on its interior, and to have his mold hot during the period when the molten sound record material was flowing and conforming itself to and around the irregular surfaces. Moreover, he was the first to show by subsequent artificial cooling, that a cast record would shrink away from the mold so as to clear the irregularities thereof, thereby permitting the separation of the two, and without interfering with the faithful reproduction in the duplicated cast record of the original master record. It is indubitable that Joyce made a distinct advance in the phonographic art, and did something which had never been done before. The ultimate and final achievement of his predecessors in the sound reproduction art (as exhibited by patents and publications prior to his application) was the mechanical duplicating machine of the Macdonald patent No. 559,806, May 12, 1896.

For all of these reasons, I am of the opinion that the Joyce process, as defined in Claims 3, 4 and 6, of his patent in suit, was substantially new.

Q. 10. You have referred in your preceeding answer to the longitudinal contraction or shrinkage of the duplicate sound records. Is this of sufficient extent to be taken into consideration in the practical making of commercial sound records?

A. It is. The ordinary reproducing machines on the market have one hundred threads to the inch for feeding the reproducing stylus, and the com-

10

20

30

40



mercial sound records should have the same pitch for the spiral sound groove thereon. To get this result, in view of the shrinkage of the material, the original sounds must be produced on a sound recording machine having a coarser pitch. In complainant's course of manufacture, as there are two shrinkages involved (one in making the duplicate masters and the second in making the commercial sound records) the pitch of the original recording machine has to be correspondingly increased, and it has 97 1-3 threads per inch. The difference in the original and final pitch is the result of the longitudinal shrinkage during the casting operations.

10  
20 Q. 11. Mr. Massie, defendant's expert, has referred to the Edison patent No. 713,209, granted Nov. 11, 1902, on an application filed March 5, 1898, in connection with the Joyce patent in suit. Please compare this Edison process with that of the Joyce patent and state the result?

30 A. This Edison process is different from that of Joyce and is a *pressing* process, as contrasted with the Joyce *casting process*. In accordance with this Edison process, a cylindrical metallic mold is made from a master record so as to have sound irregularities on its surface. A cylindrical blank of sound record material is then independently  
40 molded and is made of a diameter just less than the minimum diameter of the mold. This blank is then inserted in the mold and both are heated sufficiently to soften the record material, but not to melt it. The record material expands more than the metal mold, so as to thereby be forced by the expansion into contact with the mold surface. In case this should be insufficient, the patent suggests that the blanks can be further expanded into engagement with the mold surface by a tapering mandrel. After this is done the blank and mold

are chilled in a refrigerating chamber and the duplicate record shrinks sufficiently to be separated by longitudinal movement from the mold.

There is no suggestion of directly casting the molten record material into the mold, which is heated when the molded record material is in contact therewith, as in Joyce. Joyce avoids the preliminary making of a cylindrical blank of a precise and particular diameter; and he avoids the use of a mandrel; and insures a greater perfection in the faithful copying in the mold surface.

Assuming that the Edison process was in all respects a good one, it could by no means be inferred that molten material could give an accurate reproduction, or that its laws of shrinkage would be similar to those of a previously molded blank, which was never permitted to reach a melted condition.

The Joyce process is distinctly and radically different from that of Edison.

Q. 12. I direct your attention to the testimony of Mr. Delos Holden, on behalf of the complainants, and of Mr. Massie, on behalf of the defendant, in the comparison of the process practiced by the defendant and that defined in Claims 3, 4 and 6 of the Joyce patent in suit. Please consider the conclusions of these gentlemen and state whether or not you agree with either of them, and why.

A. I agree with Mr. Holden that the defendant practices the process defined in these claims, and I find nothing in the prior art or in the reasons given by Mr. Massie which leads to the different conclusion reached by Mr. Massie.

As I understand Mr. Massie, he distinguishes the defendant's process from that of Joyce because Joyce first heats his mold to the desired temperature before pouring the melted record material into it; whereas the defendant lowers its mold into

10

20

30

40



a bath of the molten material so quickly that the mold is still cool when it becomes filled with the molten material, and becomes heated only as the result of its immersion in the bath and the presence of the molten material inside of it.

10 The specific difference referred to by Mr. Massie does exist, but does not affect the substantial resemblance because the two specific methods are substantial equivalents. The point in heating the mold is that both mold and material shall be hot at the same time, in order that the material may adequately fill the mold and flow in and around its irregularities. This result is the same, whether the mold is first heated before the material is introduced or whether the heating of the mold is the result of the immersion in the bath. In fact, I understand Mr. Macdonald (one of defendant's witnesses) concedes that defendant's process 20 (though slower) would still be the same if the mold were lowered into the bath so gradually that it would be raised to the requisite temperature before the molten material flowed into it. This would be a pre-heating, just as if the heating were independently accomplished. No one of the pertinent Joyce Claims specifies the pre-heating; it sufficing that both mold and material should be hot to permit intimate contact. This specific difference, therefore, does not prevent their being equivalents. 30

There is nothing in the prior art necessitating the exclusion of defendant's equivalent for the equivalent pre-heating specifically described by Joyce. The defined process is equally novel, whether the mold is heated before the material is introduced or after.

Adjourned subject to notice.

(West Virginia Suits.)

Met pursuant to agreement.

Present:

Counsel as before.

Direct examination of Mr. Browne continued.

By Mr. MASSIE:

Defendant's counsel now enters timely objection 10  
to the statement in answer to Q. 6, under the head-  
ing, "Making Duplicate Masters," that the same  
"are made in accordance with the Joyce patent in  
suit," on the ground that the statement is a con-  
clusion of law and without any basis of fact in  
the evidence.

Objection is made to the estimate in the same  
paragraph for the working temperature of the mold,  
viz., 260 degrees F., on the ground that the same 20  
is purely conjectural.

Objection is made to the statement in the same  
paragraph that the master wax is substantially  
the composition of the Aylsworth patent No. 782,-  
375, on the ground, first, that the statement is in-  
competent as being merely hearsay; and second,  
it is incompetent as being a conclusion of law  
without any basis of facts.

The statement in the same answer under the 30  
heading "Commercial Sound Records," to the effect  
that complainant's ultimate commercial records  
are made in substantial accordance with the meth-  
od set forth in the Miller & Aylsworth patent in  
suit, is objected to on the ground that the same is  
a mere conclusion of law, and without sufficient  
basis of fact.

Objection is made to the last sentence of the same  
paragraph as hearsay and incompetent. 40



Objection is made to the statement in the eighth paragraph of the answer to Q. 9, on the ground that the assumption that the material *must* be rendered fluid, etc., is without basis of fact in the evidence, a pure assumption, and misleading.

10 Q. 13. Please consider the patents referred to by Mr. Massie in connection with the Miller & Aylsworth patent in suit, No. 683,615, Oct. 1, 1901, and state whether or not you find anything therein to negative the novelty of the subject matter of Claims 3, 4 and 5 thereof.

A. In answering this question, I will assume that the Court will construe these claims as being of sufficient scope to define the defendant's method as specifically practiced, as well as the specific method set forth in detail in the Miller & Aylsworth specification.

20 In accordance with the Miller & Aylsworth patent the molten wax-like material is cast in the interior of a cylindrical mold, and after the casting, and while the material is still within the mold, the interior of the wax-like material is finished by boring or reaming it out to the desired shape. After the finishing or reaming operation, the molded record is shrunk away from the metal mold and is withdrawn endwise. The finishing or reaming is done while the molded material is still in the  
30 soft or plastic condition. Hence, the cylindrical metal mold or matrix not only serves to give the desired contour to the sound groove formed in the molded record, as a result of the casting operation, but it also serves to support the molten material during the reaming or finishing operation. Owing to the finishing or reaming being done while the molten material is within the mold and is still soft, the finishing operation is easily carried out and without any danger of cracking or breaking the  
40 record; and the entire operation is carried out

quickly. Now, I fail to find in the prior art any instance of thus reaming or finishing the interior of a sound record, while it is still within the metal mold or matrix into which the wax-like material has been cast.

I will briefly refer to the various patents referred to by Mr. Massie in this connection.

*Wilder No. 185,454, December 5, 1876.* This patent is for the manufacture of wooden tubs or buckets, and comprises a hollow chuck in which the staves are inserted and which holds the staves while their interior surfaces are being turned smooth, and while the "croze" is being cut. The "croze" is the groove at the bottom of the staves in which the head of the tub or bucket is secured. This has nothing to do with the manufacture of sound records. There is no casting of material in a mold for the purpose of giving character to the outer surface; and no finishing or reaming out of the interior of such molten material, and particularly when such molten material is still soft. The Wilder patent is entirely foreign to the phonographic art.

*Edison No. 393,462, Nov. 27, 1888.* This patent relates to the making of *blanks*, in which a sound record is to be subsequently cut, and does not relate to the molding of *records* to obtain a sound groove therein. In this Edison patent no finishing or reaming is done while the blank is within the mold. On the contrary it is reamed both inside and out after the molded blank has been withdrawn from the mold. The blank is not reamed while it is still soft as the result of the molding operation; but instead, the "knives or cutters are suitably heated to a temperature slightly below the melting point of the wax composition" (line 34). The specification says that the "rapidity of the cutting



operation is such that the wax body of the blank does not melt" (line 36). The molded blank, after removal from the mold, is first reamed out on its interior or bore and is, by a second operation, reamed or finished on its exterior. Concerning the operation of reaming out or finishing the interior or bore of the blank, the specification says:

10        "For the heated cutting tool I employ, first, a tapering reamer, which is heated by the introduction of steam into its hollow body and is revolved rapidly. The molded blank is pushed onto this reamer and withdrawn from it by a continuous motion of the hand, so that the reamer by the combined cutting and heating action turns out the bore of the blank to the precise size desired." (Lines 38-46.)

20        This is wholly different from the Miller & Aylsworth patent. Edison deals with a molded *blank* and not with a molded *record*; the heat employed during the reaming operation is due to heating the knives by special appliances for that purpose, and is not due to the residual heat left in the molded record as the result of the molding operation; and Edison holds the molded blank in the hand and manipulates it back and forth during the reaming operation, instead of using the mold in which the record is cast as the support during the reaming or finishing operation.

30

Manifestly, this Edison patent does not disclose the Miller & Aylsworth method, nor does it contain anything suggestive.

40        *Edison No. 393,463, Nov. 27, 1888.* This patent simply discloses the apparatus for reaming out the molded blank which is used in carrying out the method of the Edison patent No. 393,462, just considered. The specification says:

"The hollow cylindrical wax phonogram-blanks are taken in the hand and are pushed onto the reamer and withdrawn from it by a continuous motion, the reamer being brought up to the desired temperature and the combined action of heating and cutting rapidly and smoothly reaming out the bore of the blank." (Lines 95-101.)

Hence, what I have said with regard to the Edison patent No. 393,462, applies equally to this Edison patent. In addition, this Edison patent, No. 393,462, says: 10

"The wax blanks are preferably heated by a hot table, oven, or chamber approximately to the temperature of the reamer before being cut by the reamer, in order to prevent cracking by unequal expansion." (Line 102, page 1, lines 1-4, page 2.)

Edison thus contemplated heating the blank, but by a *separate* heating operation. It did not occur to him to utilize the heat in the molded blank, due to the molding of the same, and while within the mold. On the contrary, he took the blank out of the mold and subsequently heated it by a separate operation. This gets still farther away from the Miller & Aylsworth process which not only avoids any such separate heating of the molded record, but also the heating of the cutting knives, and utilizes the mold itself as a support for the record during reaming, instead of requiring the same to be held by hand. 20 30

*Edison No. 414,761, Nov. 12, 1889.* This is likewise for a blank, and not a record, and a spiral rib is formed on the interior of the blank by molding the blank material around a ribbed core, and not by reaming out with a cutter. This patent wholly lacks the characteristic feature of Miller & Aylsworth, consisting in reaming out the bore of 40



the molded record while still within the mold in which it was cast.

*Lambert No. 645,920, March 20, 1900.* In this patent there is no casting of molten wax-like material into a mold. The specification says:

10 "I next take a soft ring of cellulose or vul-  
canized rubber, either in a raw or partially-  
cured state or previously softened with some  
solution and of sufficient thickness to receive  
in perfect form the indentations of the matrix  
and at the same time furnish a suitable back-  
ing or support for the phonographic repro-  
duction of the record. This relatively thick  
ring or tube is then placed within the cylin-  
drical opening of the matrix and by means of  
an expansive pressure with heat forced out-  
wardly, completely filling the matrix and  
20 against the inner surface thereof, thus mak-  
ing a counterpart of the same and a record sim-  
ilar to that on the original wax cylinder. The  
ring thus formed, having on its outer face a  
faithful imprint of the matrix, is then allowed  
to harden, either naturally or by artificially  
curing the substance thereof, through which  
hardening it shrinks sufficiently to enable its  
subsequent removal to be made from the mat-  
rix without injury to either." (Lines 92-100,  
page 1; lines 1-14, page 2.)

30 There is no casting of wax-like material within  
the mold in this patent, but instead a previously  
formed and shaped ring of cellulose or rubber is  
inserted into the mold, and when softened by heat  
is forced outwardly in contact with the mold.  
There is nothing to indicate that this outward  
forcing in any way affects the character of the  
ring of cellulose or rubber. There is no suggestion  
for finishing the interior or bore of a sound record,  
which has been molded by casting, and while still  
40 within the mold.

*Edison No. 667,662, Feb. 5, 1901.* In accordance with this patent the molded records are withdrawn from the mold after being made in the manner described. The specification says:

"The resulting duplicates thus secured after reaching the normal temperature are properly dressed at the ends and are reamed internally to the proper size, being then ready for use."  
(Page 2, line 110.)

10

Edison thus reams out a cold sound record after it has been removed from the mold; and does not ream out or finish the bore while the molded record is still soft and within the mold.

*Edison No. 713,209, Nov. 11, 1902.* In accordance with this patent a cylindrical blank is placed within a mold and is then expanded outwardly by a mandrel. There is nothing to indicate that the forcing action of the mandrel has a finishing action on the interior of the previously formed blank. There is no suggestion for finishing the interior bore of a molded record while still within the mold, in which it has been cast.

20

*Joyce No. 831,668, Sept. 25, 1906.* This patent I have already discussed at length. The specification says that after the wax has been poured into the mold it will generally have the exact form of the mold when cooled, "but under certain circumstances the wax cast may be subjected to pressure in any of the usual ways." (Page 2, line 4.) The specification then says:

30

"A hydraulic-pneumatic or other pressure may be applied to the wax column as is done in casting metal. A good way to apply pressure, however, is to wait until the wax is partly set and then screw down the tapering core into its base I. This not only compresses, but expands the wax outwardly insuring that all parts of the mold are impressed into and re-

40



produced by the wax." (Page 2, lines 5-9.)

No finishing is thus done to the interior or core of the molded record.

Mr. Massie also refers to the two Macdonald patents, dated September 17, 1901, No. 682,991 and No. 682,992, but I do not understand that he refers to these as a part of the prior art (as their application dates are later than that of the Miller & Aylsworth patent in suit No. 683,615), but simply as illustrative of certain steps used by the defendant in making the sound duplicate records. However, neither of these patents shows the finishing of the interior of the core of the duplicate sound record, as a special operation following the casting of the wax-like material in the mold and while still in the mold. In these Macdonald patents the interior of the molded record is given form as the result of the casting operation itself, in this respect, so far as concurrent interior shaping and exterior molding are concerned, resembling the modified method of the Joyce patent No. 831,668, just referred to, and the method of the Edison patent No. 713,209, and of the Lambert patent, No. 645,920, wherein the internal pressure applied within the hollow record is a part of the operation of obtaining the sound groove on the exterior of the record. As shown in these Macdonald patents, the records are molded with an interior spiral rib.

This review of the art shows that Miller & Aylsworth, by the patent in suit, No. 683,615, first disclosed a separate finishing operation to shape the interior of a molded sound record, while the molded record is still within the mold in which the material of which it is composed had been cast while in a molten condition. This method is new and of great practical utility. It insures a sound record of minimum weight, which will exactly fit a sound-

reproducing machine; the interior finish is accomplished when the sound record is adequately supported and while the material may still be soft, so as to insure easy cutting without danger of breaking or splitting the sound record; and the operation is simplified, since there is no intermediate handling of the sound record itself, apart from its mold between the casting and the finishing.

Q. 14. I direct your attention to the testimony of Mr. L. Seward Bacon, on behalf of complainant, and of Mr. Massie, on behalf of the defendant, in the comparison of the process practiced by the defendant, and that defined in Claims 3, 4 and 5 of the Miller & Aylsworth patent in suit, No. 683,615. Please consider the conclusions of these gentlemen and state whether or not you agree with either of them.

A. I agree with Mr. Bacon that defendant practices the process defined in these claims, and I find nothing in the prior art or in the reasons given by Mr. Massie which leads to the different conclusions reached by him.

As I understand Mr. Massie, he distinguishes the two methods because in Miller & Aylsworth the casting step is specifically different from the casting step employed by the defendant. Miller & Aylsworth specifically describe lowering a cold mold, open at its bottom, into a bath of molten wax-like material, which flows upwardly into the interior of the mold, chilling and accumulating therein until the desired thickness of material is formed, whereupon the mold is withdrawn with the molded material adhering to the interior thereof, and partly congealed. On the other hand, in the defendant's manufacture, a mold closed at the bottom and having an interior core, is immersed into the molten bath of wax-like material, so that the molten material flows down through the open top

10

20

30

40



and fills the space between the mold and core. The mold remains immersed until it is heated by the bath of molten wax. When the mold is withdrawn filled with wax, both the mold and wax are hot and the wax is in a molten condition. Also, Miller & Aylsworth melt the wax only a little (20 to 40 degrees F.) above the melting point of the wax, and the immersion of the mold does not last long enough to allow its temperature to be raised sufficiently to permit the deposited molten material thereon to become remelted, the mold being shielded to prevent its rapid heating; whereas in defendant's manufacture, the wax is superheated many degrees above its melting point, and the mold is permitted to remain immersed until it is of substantially the temperature of the bath of melted wax.

20 The specific differences to which Mr. Massie refers exist, but none of them are called for by any one of the pertinent claims of the patent in suit, except as may be inferred from the language used in each of these three claims, which refers to immersing the molten wax-like material "whereby the material will accumulate on the bore of the matrix or mold and chill thereon in a layer of the desired thickness." This quoted language seems sufficiently comprehensive to define both methods. Even, 30 however, should it be construed to mean that the material congeals within the mold while the mold is yet within the molten bath, nevertheless, the specific method carried out by the defendant is the equivalent of the corresponding step in the Miller & Aylsworth patent. The point of these Claims is that after the molding has been done by casting the molten wax-like material within the mold, and after the casting operation is complete, the interior of the molded record is shaped and finished, while 40 the record is still within the mold, this finishing

being a separate operation independent of the casting, and the formation of the sound groove by casting; and in accordance with Claim 5, this finishing is done while the cast record is still soft, or before it has become hard. This essential method is carried out by the defendant, and defendant differs from Miller & Aylsworth simply by a different specific way of doing the casting; defendant's specific casting method being the equivalent of the specific casting method used by Miller & Aylsworth. 10

The differences, therefore, pointed out by Mr. Massie do not affect the substantial resemblance, but simply involve, as to one step, the substitution of an equivalent.

Q. 15. Please consider the patents referred to by Mr. Massie in connection with the Aylsworth & Miller patent in suit, No. 683,676, Oct. 1, 1901, and state whether or not you find anything therein to negative the novelty of the subject matter of Claims 6 and 7 thereof. 20

A. I find nothing in the patents referred to by Mr. Massie negating the novelty of the subject matter of these Claims 6 and 7 of Aylsworth & Miller patent in suit.

This patent is for apparatus used in carrying out the process of Miller & Aylsworth patent, No. 683,615, already considered. The point of these Claims is that the mold has a two-fold function; it is used with a casting means, so that a sound record is cast therein, with a sound groove on its exterior; and the same mold serves as a support for the cast record, while its interior is finished. 30

In accordance with Claim 7, the mechanism employed is such that the duplicate record is formed on its interior with "a series of concentric ribs of gradually increasing diameters, from one end of the duplicate to the other, whereby the duplicate 40



may be properly received upon a tapered mandrel."

I will briefly consider the various patents referred to by Mr. Massie.

10 *Brunner, No. 95,645, Oct. 12, 1869.* This patent is for casting hollow toys out of readily molten soft metal by means of dipping a hollow, open-bottom mold into the bath of molten soft metal. There is no subsequent finishing of the interior. The mold is a divided one which otherwise the cast articles could not be removed. There is nothing in it to suggest the making of phonographic sound records.

20 *Wilder No. 185,054, Dec. 5, 1876.* This patent is for making tubs and buckets out of wooden staves. There is no casting operation involved. I have referred to this in answer to Q. 13. Mr. Massie suggests, in answer to Q. 18, that "the cutting of a plurality of grooves, leaving a plurality of concentric rings would be obvious if such concentric rings were desired." The purpose of a single concentric groove in Wilder is to form a groove for the bottom of the tub or bucket. Manifestly, there never could be any desire of making a tub or bucket with a lot of concentric grooves on its interior. However this may be, Wilder only described forming one groove, and no one desiring to improve the phonographic art would think of looking into the manufacture of wooden tubs or buckets for information. There is no intimation of using the same feature as a mold for casting and forming an exterior surface, and as a support while reaming out or finishing the interior.

30 *Edison, No. 393,462 and 393,463, Nov. 27, 1888.* I have discussed both of these patents in answer to Q. 13. They simply disclose reaming out a tapering bore of a previously molded blank, the blank being held in the hand. No concentric ribs

40

are formed, and the finishing of the interior is not accomplished while the blank is in position within the matrix or mold.

*Edison, No. 414,761, Nov. 12, 1889.* I referred to this patent in answer to Q. 13. In this case a blank is formed and not a sound record. A core is employed with a spiral groove, so that the melted material poured in the space between the smooth mold and the core, gets, as a result of this casting operation, an interior bore with a spiral rib. The core is subsequently removed by unscrewing the same from the blank. This operation is carried on by the complainant herein in making its blanks. This patent wholly fails to disclose an apparatus wherein a mold has a two-fold office, namely, serving to receive molten material so as to form a sound groove on the exterior thereof; and secondly, serving to support the molded sound record while its interior is being finished. Also, it fails to show any way for making the concentric ribs called for by Claim 7 of the Aylsworth & Miller patent in suit. In connection with the concentric ribs, Mr. Massie, in answer to Q. 18, says:

"And Edison says: 'I prefer to form a spiral rib.' This is a disclosure of 'ribs' in general and 'spiral ribs' in particular. The only internal ribs other than spiral that would naturally occur to one are either *longitudinal* ribs or *concentric* ribs. This same Edison patent likewise refers (near the top of the second column) to *reaming out the interior* of the phonogram-blanks." (Mr. Massie's italics.)

It does not seem to me that any inference can be drawn from this Edison patent, No. 414,761, that concentric ribs could be used. Nothing is said about them, and manifestly it would be impossible to make concentric ribs by the plan shown in this Edison patent, and get the blank off from the core.



A spiral rib is possible, because the separation of core and blank can be effected by unscrewing. Obviously, when the Edison specification says:

"I prefer to form a spiral rib on the interior surface of the blank." (Line 30.)

10 the preference is between the ribs as contrasted with the "flanges or projections" mentioned at line 20. Manifestly, it would be possible, in accordance with the method of this patent to have separate and detached flanges or projections (as distinguished from the spiral rib) which, if spirally arranged, would permit the separation of the core and blank. Also, it would be possible to have longitudinal ribs, and still separate the core and blank. But concentric ribs would be an impossibility, and hence cannot be inferred from an expressed preference for a spiral rib.

20 *Edison, No. 667,662, Feb. 5, 1901.* This patent was referred to in my answer to Q. 13. It describes no concentric internal ribs, and no finishing of the interior of the record while still within the mold.

30 These are all of the patents referred to by Mr. Massie. They show that it was new with Aylsworth & Miller to provide a mold having a double office, namely, to form a sound groove in the exterior surface of record material, which is cast therein; and second, to support the molded sound record while, as a subsequent operation, its interior is being finished.

It was also new with Aylsworth & Miller to finish the interior of the sound record with concentric ribs. These characteristics are useful; are new; and are used by both the complainant and by the defendant.

40 Q. 16. Mr. Massie, as I understand, expresses the opinion that aggregations and not combinations

are recited in each of Claims 6 and 7 of the Aylsworth & Miller patent in suit. Please state whether or not you agree with Mr. Massie.

A. I do not. The essence of combination is co-operation; and to constitute an aggregation there must be absence of co-operation. In the present instance there is co-operation. The mold itself is a connecting element between the devices which do the molding and the devices which do the reaming or interior shaving, and the resulting product has a molded external sound groove and a finished interior. The mold is common to the two operations, receiving the molten wax-like material during the casting and supporting the molded material during finishing.

10

Q. 17. Please consider the prior art referred to by Mr. Massie in connection with the subject matter of Claim 5 of the Aylsworth & Miller patent in suit, No. 683,676, Oct. 1, 1901, and state whether or not you find anything therein to negative the novelty of said subject matter.

20

A. I do not find anything in the prior art referred to by Mr. Massie to negative the novelty of the subject matter of Claim 5 of the Aylsworth & Miller patent in suit.

The point of this Claim is an apparatus which simultaneously obtains a sound groove on the cylindrical surface of the sound record; and a designation on the end of the sound record which shall indicate in visually intelligible characters the name of the composition constituting the sound record. As clearly shown in Fig. 1, the mold carries a disc at one end containing the name characters, so that the name and sound groove are simultaneously molded, as a result of the casting operation.

30

The only patents specifically referred to by Mr. Massie were, I believe, Edison, No. 667,662, Feb. 5,

40



1901, and Schuberth, No. 359,637, March 22, 1887.  
1887.

Adjourned until April 17, 1908.

Direct examination of Mr. BROWNE continued.

Met pursuant to adjournment.

10 Present:

Counsel as before.

April 17, 1908.

A. Continued to Q. 17. Mr. Massie concedes that the Edison patent, No. 667,662, does not have the reverse letters for imprinting the designation of the sound record at the beginning of his answer to Q. 21.

20 The Schuberth patent, No. 359,637, is for a soap press, which is wholly foreign to the phonographic art, as evidenced by the mode of operation which Schuberth thus describes:

30 "The *modus operandi* of the device is as follows, to wit: A chunk of soap of a somewhat greater quantity than required for the piece to be formed being placed on the lower mold, A, the upper mold B, is moved down upon it, whereby the soap is pressed between to assume the shape of such mold, the surplus being pressed out between the edges and cut-off. Then the upper mold, while being lifted again, will leave the soap sticking in the lower mold, whence it is displaced by depressing lever E to elevate die D, which raises the soap to clear the mold, that then can be easily picked up and removed.

The die D may be engraved to produce the impression upon the soap of a monogram, trademark, or other character." (Page 1, lines 77-93 inc.)

40 Schuberth starts with a chunk of solid soap, in-

serts it into his press and shapes the solid soap and puts lettering on one side *only* of the soap.

So far as the prior art is concerned, Miller & Aylsworth were the first to ever provide apparatus for putting a readable marking on the end of a phonograph sound record; and they were the first to make such marking simultaneously with the production of the sound groove. This was new with Aylsworth & Miller; is useful and desirable; and is adopted by both complainant and defendant.

The real attack made by Mr. Massie on the subject matter of Claim 5 of the Aylsworth & Miller patent is the general denial that there was any act of invention required in providing the molding apparatus with reverse lettering at one end, so that readable markings are formed concurrently with the formation of the sound record. The desirability of having each sound record bear a distinguishing readable mark must have been known from the beginning of the art, but nobody pointed out apparatus for doing it before Aylsworth & Miller. Moreover, the Aylsworth & Miller apparatus does not call for indiscriminate marking, but for marking in a particular way. It might well be conceded that the bald idea of putting an intelligible marking on a sound record would be obvious; but this is not all that Aylsworth & Miller have done. On the contrary, they have provided apparatus for making this marking on one end of the sound record. This is of special utility, since the records most conveniently stand on one end in the factory, thereby preserving their sound surfaces from injury, and by having the markings on the upper end, the records are readily selected for assorting and packing. Moreover, the records are packed and sold in suitable boxes with the marked end at the top, so that they can be readily identified.

These considerations show an intelligent adapta-

10

20

30

40



tion of means toward a particular end, having special utility in the manufacture of duplicate sound records; and as novelty is present, the quality of invention follows.

By Mr. Massie: The last statement of the witness, referring to the quality of invention is objected to as incompetent on the ground that the same is a pure question of law.

10

Q. 18. I direct your attention to the testimony of Mr. L. Seward Bacon on behalf of complainant, and to Mr. Massie on behalf of defendant in comparison of the apparatus employed on behalf of defendant and that defined in Claims 5, 6 and 7 of the Aylsworth & Miller apparatus patent in suit, No. 683,675. Please consider the conclusions of these gentlemen and state whether or not you agree with either of them.

20

A. I agree with Mr. Bacon that defendant's apparatus has the subject matter defined in the Claim and I find nothing in the prior art, or in the reasons given by Mr. Massie which leads to the different conclusions reached by him.

30

Mr. Massie's conclusions are reached upon specific differences between the apparatus of defendant and of Aylsworth & Miller, which are substantially the same differences which he urges in connection with the two methods and which I have discussed in answer to Q. 14. These specific differences relate to the details of the apparatus, whereby the particular casting steps are performed. These specific differences are not called for by the language of the pertinent claims, except insofar as they may be involved in the interpretation of the expression "means for depositing molten material within the matrix or mold and upon said disc," as used in Claim 5, or the expression, "the means for

40

securing the deposit of a wax-like coagulable ma-

terial upon the bore of a matrix or mold," as used in Claims 6 and 7.

Mr. Massie contends that these words "depositing" and "deposit" identify the particular casting method employed by Aylsworth & Miller, and hence the particular construction of the apparatus which permits this particular method to be carried out. On the other hand, it seems to me these words are comprehensive in their character and as generic as any words which might be selected competent to define both methods. Assuming, however, that Mr. Massie's interpretation of these words is correct, nevertheless in this respect the specific means employed by the defendant are the equivalent of those employed by Aylsworth & Miller.

The point of Claim 5 is that the mold is of such character that the material cast therein simultaneously gets a sound groove on its cylindrical surface and a readable marking on one end; the point of Claim 6 is that the same mold serves at one stage of the operation to receive the molten material cast into it, and at another stage of the operation to support the molten material while being finished on its interior; and the additional point of Claim 7 over what is recited in Claim 6 is that the apparatus forms concentric ribs of gradually increasing diameter from one end of the duplicate to the other on its interior. These characteristic features were new with Aylsworth & Miller and are present in defendant's apparatus.

#### STIPULATION.

Complainant's counsel offers in evidence the various publications and patents referred to by the Witness Browne, during his direct examination, and it is stipulated that the three books referred to were published upon the dates recited in their title pages, that the various patents were issued

10

20

30

40



upon the dates appearing on their faces, upon applications filed on their respective dates recited in each patent, subject to correction for error upon due notice.

It is further stipulated that the books offered in evidence may remain in the possession of complainant's counsel, to be produced if called for upon reasonable notice.

10     The exhibits are now marked "Complainant's Exhibits" with the following respective designation:

      Brannt—Manufacture of Soap & Candles—1888;

      Carpenter—Soap and Candles—1885;

      Ott—Soap and Candles, 1867;

      Edison British patent No. 1644 of April 24, 1878;

      Edison patent No. 200,521, Feb. 8, 1878;

      Bell & Tainter patent No. 341,214, May 4, 1886;

20     Tainter patent No. 341,287, May 4, 1886;

      Tainter patent No. 341,288, May 4, 1886;

      Edison patent No. 382,419, May 4, 1886;

      Edison patent No. 382,462, May 8, 1888;

      Herrington patent No. 399,264, March 12, 1889;

      Herrington patent No. 399,265, March 12, 1889;

      Edison patent No. 430,274, June 17, 1890;

      Douglass patent No. 475,490, May 24, 1892;

      Bettini patent No. 484,381, Dec. 20, 1892;

30     Edison patent No. 484,582, Oct. 18, 1892;

      Edison patent No. 484,584, Oct. 18, 1892;

      Amet patent No. 539,212, May 14, 1895;

      Amet patent No. 545,439, Sept. 3, 1895;

      Macdonald patent No. 559,806, May 12, 1896;

      Aylsworth patent No. 782,375, Feb. 14, 1905.

#### CROSS-EXAMINATION.

Without waiving the objections heretofore entered, Mr. Massie cross-examines as follows, any cross-examination upon the matters objected to being *de bene esse*.

40

x-Q. 19. You testified, did you not, as an expert for the present defendant, the American Graphophone Company when it was a complainant against the Edison Phonograph Works, charging infringement of the Bell & Tainter graphophone patent, No. 341,214 and the Tainter graphophone patent, No. 341,288, both dated May 4, 1886?

A. Yes.

x-Q. 20. That about a dozen years ago, was it not? 10

A. Yes.

x-Q. 21. In what patent suits relating to the talking machine art have you given testimony since then?

A. About the time of the suit by the American Graphophone Company against the Edison Phonograph Works I also testified on behalf of the American Graphophone Company in a suit against the United States Phonograph Company and others, in which the Bell & Tainter and Tainter patents, above mentioned, were involved. Also, about the same time I testified on behalf of the American Graphophone Company in a suit brought against them on an Edison patent for coin-operated talking machines. Some time after that I testified for the American Graphophone Company for a suit brought on the same Bell & Tainter patent against a defendant in Chicago, whose name I have forgotten. I believe the defendant's name was Amet. More recently I have testified for the Edison Company against the Columbia Phonograph Company, General, in a suit on the Aylsworth patent No. 782,375 on a composition used for making sound records. Also, I have testified in a suit between the American Graphophone Company and Smith on behalf of Smith, involving a contract with reference to a method of making duplicate sound records. 20 30

x-Q. 22. I call your attention to the report of a 40



case entitled American Graphophone Company against Amet on page 789 of Vol. 74, Fed. Rep.; also to decree appearing page 1008 of the same volume, both of which appear to be dated April 6, 1896. Is this the case you referred to in the last answer as having a Chicago defendant?

A. I think so.

- 10 x-Q. 23. In answer to Q. 6, under the heading "Blank-making," you refer to the Edison patent No. 430,274, June 17, 1890. So far as you know has the specific composition set forth in that patent ever been used successfully and commercially?

A. I do not know of my own knowledge, but have been advised that the specific soap composition used commercially is different from that of the soap composition specified in this patent.

- 20 x-Q. 24. What composition does Joyce in the patent in suit, direct us to use?

A. He states at line 19, page 2, that he employs the "usual phonogram compound" from which I understand that he used the same compound which was then used for making phonograph records. He states, however, that he does not limit himself to any particular compound.

- 30 x-Q. 25. What was the usual phonogram compound used at the date of filing the Joyce application?

A. It was a metallic soap compound. I understand it was a composition made from stearic acid, caustic soda or sal-soda, or both, a little aluminum, and a hydrocarbon wax.

x-Q. 26. Have you examined the Edison deposition offered in evidence herein by defendant?

A. No, I did not know that such deposition had been offered in evidence.

- 40 x-Q. 27. Confining yourself for the moment to the steps and directions specifically disclosed by the

Joyce patent, that is without attempting to apply what you may regard as the broad scope of Joyce's claims to more or less equivalent processes, so far as you know, could the specific Joyce process disclosed be employed with the specific composition of the Edison patent No. 430,274, above referred to, to produce satisfactory molded records?

A. I cannot say because I do not know what the behavior of that particular Edison composition would be. 10

x-Q. 28. The same question with regard to the specific composition of the Bell & Tainter patent No. 341,214, namely beeswax and paraffine?

A. I cannot tell, because I do not know how that beeswax and paraffine composition would act.

x-Q. 29. In a suit now pending between the same parties here litigating it is testified to or admitted by both parties that the regular record composition in use about the period of 1897 was substantially the composition disclosed in the Macdonald patent No. 606,725, July 5, 1898 (application filed April 27, 1896). Assuming this to be correct, could the specific steps and disclosures of the Joyce patent in suit be used with that composition to produce satisfactory molded records? 20

A. Yes, except that the records made of that material would not today be regarded as satisfactory when compared with the records made from the modern materials on account of the greater softness and hence lesser durability of the old material. 30

x-Q. 30. What is the authority for the answer you have just given?

A. I have tried the Joyce process in connection with the old composition with successful results.

x-Q. 31. To what temperature did you raise the mold; or are you now referring to what you have stated in your answer to direct Q. 6, under the head of "Making Duplicate Masters"? 40



A. In trying the Joyce process with the old composition, the mold was heated in the same manner as I stated in answer to Q. 6, relating to molding duplicate masters. That is to say, the mold was heated until the attendant told by wetting his finger that moisture would sizzle on the surface of the mold. In the test of the temperature that I made, the indication was that the mold was heated to something less than the melting point of the soap composition.

The material was the same that is commercially used by the complainant in making its blanks, that material being the soap composition that has long been used by complainant and it was heated to the usual temperature, which is about 320°F.

x-Q. 31. I understand that in the tests just referred to you took an unsplit cylindrical record mold, having a core, and the ordinary blank-mixture used by complainant; and that with the exception of first warming the mold as stated by you, in all other respects you carried out precisely the steps, temperatures, etc., employed by complainants in making their blank cylinders?

A. Yes, except that the steps were not the same. In making the ordinary blank composition, there is no chilling of the mold. In making the blanks, the mold is pulled off while the material is still soft and warm and the spirally threaded core is unscrewed, while the material is still soft and warm. In testing the Joyce process with the blank material, the procedure was followed as specified by me in answer to Q. 6, under the heading "Making Duplicate Masters."

x-Q. 32. There is testimony in the record as to the temperature given the material by complainant in molding duplicate masters; but there is no testimony heretofore given as to the temperature employed by complainant in molding its blank cylinders. You have said it is about 320°F. Are you

testifying from actual observation, or from a general understanding and information?

A. From actual observation, subject to my present recollection as to the temperature. I noted the temperature at the time, and my recollection is that it was 320°F.

x-Q. 33. In your answer to Q. 6 under the heading "Making Duplicate Masters," you read the temperature of the mold after it had probably cooled somewhat as 249°F., and estimated that the working temperature would be about 260°F. In your answer to x-Q. 31 you say it was "something less than the melting point of the soap composition." Do you mean about the same temperature in each of those two answers? 10

A. Yes.

x-Q. 34. In the test made by you did you slightly oil the mold and the core? 20

A. I did on one occasion, and was unable to appreciate any difference in the product except that perhaps when oil was used the surface exhibited a rather more polished appearance.

x-Q. 35. I understand that oil is not used in complainant's regular process of molding duplicate masters. That is so far as you have observed that process?

A. That is correct.

x-Q. 36. In carrying out your tests, did you attempt to artificially chill the interior of the casting or duplicate record? 30

A. No, except in so far as the core may have been chilled by the immersion of the mold and core in the cold water.

x-Q. 37. That is, the core has no accessible interior for the entrance of cold water; so that whatever artificial cooling may have been applied to the interior of the casting was due to conduction 40



of heat from the core to the base and other metal parts that were actually in contact with cold water?

A. You are correct.

x-Q. 38. I understand that your tests were carried out with the exhibit entitled "Complainant's Exhibit Commercial Joyce Apparatus"?

10 A. With one just like it. My recollection is that this exhibit was the identical one used in making the test with oil in the mold.

x-Q. 39. Was it known prior to Joyce's filing date that the wax-like record composition then in general use would shrink radially to a sufficient amount to permit the ready withdrawal of the casting from an unsplit cylindrical mold?

A. I do not know the facts in this particular.

20 x-Q. 40. (Mr. Massie interrupts and adds): By the noun "casting" in the previous question, I mean to include the sound-record existing in solid shape within the mold whether formed by the specific process of pouring melted wax or otherwise?

30 A. Personally, I do not know the facts. I understand, however, that there was a contest between Edison and Joyce as to the particular matter now inquired of, and that Joyce conceded priority to Edison. I understand, however, that Edison's plan was to take a previously molded cylinder and to expand it by heat (aided possibly by an interior mandrel) so as to get the impression of the sound record of the mold, and then utilize the ensuing contraction to permit endwise separation of mold and record. So far as I know, Joyce was the first to ascertain that there would be a shrinkage between the cast melted material passing from liquid to solid form sufficient to permit endwise separation.

40 x-Q. 41. In your answer to Q. 9, particularly

in the 7th and 8th paragraphs thereof, you refer to the prior art of molding or casting general articles, before the advent of the talking machine. What was the practice in regard to the time for removing such castings, whether they were candles or glass bottles or articles of metal?

A. The time or removal in molding candles seems to have varied widely depending upon the material and the particular method practiced.

10

In making metal castings in sand, the sand is not removed until the casting is sufficiently chilled to maintain its form and not be affected by the removal of the same. This will depend upon the size of the casting. I do not know that I can give any time from observation or available literature.

In the case of casting glass in a metal mold the mold can be removed very quickly after the cast has been made—inside of a minute.

20

Also, in casting soft metals in a split metallic mold I should say from recollection, based on observation that this can be done very quickly, depending upon the amount of metal in the mold to convey away the heat. In some cases, in less than a minute.

x-Q. 42. I did not mean to inquire concerning the actual time elapsing. The question is whether in those other arts it was the practice not to separate the casting and the mold until the former had become set and was not in any sense "semi-plastic"?

30

A. Yes.

x-Q. 43. In answer to Q. 6, you refer to the Edison patent No. 414,761 of Nov. 12, 1889, as illustrating the molding of blank phonograph cylinders. What does this Edison 1889 patent teach in regard to the matter inquired of in the two preceding questions,—that is, with regard to

40



when the casting should be removed from the mold?

A. The Edison patent does not state when the separation should be effected.

10 x-Q. 44. Assuming that the art prior to talking machines taught that in making castings, the casting must be allowed to become set before it is removed from the mold, and assuming further that this Edison patent of 1889 has taught the public how to mold blank phonogram cylinders of the wax-like soap composition, without changing the teaching of the prior art with regard to the time of removal—what would the ordinary skilled workman do with regard to when he should remove his cast phonogram blank from the unsplit mold of that Edison patent 414,761?

20 A. He would, I think, experiment and find out the best practice. What has actually been done is to separate the molded blank and core while the material is still soft and warm.

x-Q. 44. In your opinion, the practice just indicated by you would be an improvement and an advance upon the disclosures of the Edison patent No. 414,761, would it not?

A. No, I think it would be the result merely of practically trying the method.

30 x-Q. 45. Logically, the particular method named in your answer to x-Q. 44 must be either identical with the particular method named in x-Q. 42, or more or less different therefrom. I understand you to admit that specifically the two are different; do you mean that the particular practice named in answer to x-Q. 44, although different specifically, is not an advance or an improvement, but a step backwards?

40 A. No. Nothing in the outside art referred to in x-Q. 42 indicates when molded blank material should be removed. The Edison patent No. 414,761

does not state when the removal should take place, but leaves it to the judgment of the artisan practicing the method. Hence, there is no standard in the prior art to ascertain whether the removal while still warm should be regarded either as an advance or a retrogression. It is different from the practice in the remote arts.

x-Q. 46. If the skilled workman had the mold of that Edison patent No. 414,761 and undertook with the ordinary record-composition of the period around 1896-7 to mold phonograph blanks in accordance with the instruction of that same Edison patent, and if he should follow the practice of the earlier casting arts and should permit his casting to become completely set and reach normal room temperature,—would he have departed in any particular from the teachings of that Edison patent? 10

A. No, but I doubt if he could successfully remove the core except by a large percentage of breakage. 20

x-Q. 47. Assuming the cases where the castings should not be broken, what would be the shape of the exterior of the casting from that Edison mold and what would be the nature of its surface, if the casting had become completely cold before removal?

A. I do not know. The general shape would undoubtedly be cylindrical, and whether or not there would be a smooth surface, I cannot tell without trying it. 30

x-Q. 48. Have you read the depositions of Macdonald and other employees of defendant herein that were introduced into this case as exhibits?

A. I was not aware that such depositions were introduced.

x-Q. 49. Why would the exterior surface of the casting be cylindrical or at least cylindrical in general shape? 40



A. Because the mold is cylindrical.

x-Q. 50. Unless some other factor (such for instance as peculiarity of shrinkage, or the like) should intervene, would not the casting in theroy at least have the exact shape of the mold?

A. Yes.

10 x-Q. 51. And with the same proviso, would not the casting have an exceedingly smooth surface, or a fairly smooth surface, or an irregular surface, depending upon the condition of the surface of the mold?

20 A. I am unable to say. If, however, some effect did not arise through the action of the material itself, as the result of the solidifying under the stated conditions, I should say theoretically that the molten material would have a smooth surface, and the surface would conform to an irregular mold provided that the mold is not sufficiently irregular to interfere with the free withdrawal of the molded blank.

x-Q. 52. Was not the co-efficient of expansion of the ordinary phonograph-material in common use prior to Joyce's filing date fairly well known to persons in this art?

A. I think so.

30 x-Q. 53. Without going into the precise figures that composition contracts amply sufficient to cause a clearance between the record-surface of a record-mold, and the minute record-lines produced in the casting, does it not?

A. It does when the mold is artificially chilled on the exterior. What would be the effect without this artificial chilling, I am unable to say.

40 x-Q. 54. Referring to your statement towards the close of the paragraph headed "Recording Sounds" in answer to Q. 6, where you name the Edison British patent did you not testify in the suit upon the Bell & Tainter patent, named in x-Q. 19,

that the making of the "original" sound record in a practical way is first disclosed by said Bell & Tainter patent No. 314,214 and the Tainter patent No. 341,288?

A. I do not recall what I then said, but it is a fact that the first practical commercial successful sound records were made in accordance with the method and apparatus of the Bell & Tainter and Tainter patents. The original Edison phonograph, while it would record and reproduce sounds, (as I recall very distinctly having heard one of them about 1878 or 1879) nevertheless had not then reached what I should regard as a commercial status because the tin-foil had to remain on the machine where the record was made and after a relatively small number of repetitions the record would become much distorted by the reproducing stylus, so that the sounds became indistinct.

x-Q. 55. In the same Q. 6, under the heading "Sound Reproduction," you refer to the Edison sapphire reproducing style. Did you not testify in the former suit above referred to that the first practical apparatus for reproducing sound, with which sound records could be interchangeably employed was disclosed by the said Bell & Tainter patent?

A. I do not recall what I said, but I understand the fact to be as you now state it.

x-Q. 56. Is it your understanding that in the quality of the product, the method practiced by complainant for producing its molded masters, far surpasses complainant's method for producing its ultimate duplicates for the market?

A. No, except in so far as that greater care is exercised in carrying out the process in making duplicate masters.

x-Q. 57. Is it your opinion and understanding that if the same care were taken in carrying out



the method described by complainant's rebuttal witnesses for molding the masters, and if exactly the same care were taken by equally skillful workmen in carrying out the method described for making complainant's ultimate records for the market, and assuming the same composition used in each case—then the product in each case would be identical in quality with the product in the other case?

10

A. Yes.

x-Q. 58. Why then, do you understand that complainant uses one process for molding its masters and the other for molding its article for the market, instead of merely having its most skilled workmen for the former, and the same process in each case?

20

A. I am not advised as to the reasons. Possibly, because there may be greater uniformity in result in the process followed in molding master duplicates.

30

x-Q. 59. At the outset of your answer to Q. 6 you enumerate the six "chapters" as I may call them, in the production of the ultimate molded record for the market; and at the end of that answer you point out that the exigencies of this art demand these elaborate and peculiar steps. Do you understand that any of the steps employed (1) in producing the blanks or, (2) in making the original cut record, or (3) in making the metallic molds for masters, or (5) in making the further metallic molds for the commercial articles, are set forth in and by any claim here in suit?

A. No.

40

x-Q. 60. Do you understand that any claim of the Miller & Aylsworth process patent or of the Aylsworth and Miller apparatus patent here sued on, recites or covers any steps employed in (4) the making of the molded masters?

A. Not specifically, although they might be employed in molding masters.

x-Q. 61. I am inquiring of the specific process described by you in answer to Q. 6, under the heading "Making Duplicate Masters," and as described by complainant's witness Shannon. If this specific form of process is set forth by any claim (in suit) of the two patents just inquired of, please specify such claim or claims.

10

A: The subject matter of claim 6 of the Aylsworth & Miller apparatus patent No. 683,676 is employed in making the duplicate masters; but none of the other pertinent claims of these two patents is employed.

x-Q. 62. In making complainant's molded masters, what "means for finishing the interior of the duplicate while the latter is in position within the matrix or mold, substantially as set forth" (in claim 6 of the Aylsworth & Miller patent) is employed?

20

A. A reaming knife is employed which reams out the material of the molded masters, to bring it to the desired interior shape.

x-Q. 63. In giving your answer, did you have in mind the fact that complainant's molded masters have no interior rib, but the bore is a taper formed by a straight edge?

A. Yes.

30

x-Q. 64. In your opinion do the mold and other instrumentalities described by complainant's witness Shannon in his answer to Q. 3 and by yourself in your answer to Q. 6, under the heading "Making Duplicate Masters" constitute "means for securing a deposit of a wax-like coagulable material upon the bore of a matrix or mold which carries the representation of the record to be duplicated" (being a quotation from the same claim 6 of Aylsworth & Miller)?

40



Yes.

x-Q. 65. Is the step (6) of making the ultimate commercial duplicate record, as set out in your answer to Q. 6, covered or set forth in any claim (in suit) of the Joyce patent?

A. No.

10 x-Q. 66. You have described the steps or process employed by complainant in producing its molded *masters* and you have likewise described the steps or process complainant employs in molding its *commercial* duplicates; which of these two (specifically different) processes in your opinion more nearly resembles the specific process described in this record as defendant's process?

A. That is difficult to say, because in each case there are resemblances and differences.

20 For example, in comparing the molded master process practiced by complainant with defendant's process, they are alike in that the molten material is introduced into the top of the mold, and when the mold is filled with material, both are hot. On the other hand, the two methods differ because complainant does not immerse the mold in the molten wax, but pours the wax into the mold; and complainant does not apply the name to the end of the master record and does not make any concentric ribs on the interior. In these latter re-  
30 spects, defendant's method is more nearly like complainant's way of making the commercial-duplicates.

Therefore, it is difficult to compare the resemblances and differences as to nearness.

40 x-Q. 67. Please go back for a moment to x-Q. 64 and indicate the *things* named by Mr. Shannon in answer to Q. 3 and by yourself in answer to Q. 6 that constitute the "means for securing a deposit of wax-like coagulable material

upon the bore of the matrix or mold," as set forth in the Aylsworth & Miller claim 6?

A. Primarily these means include the mold and the core with the attached bottom, and the removable top ring. Also, to get the molten wax-like material into the mold involves a wax tank, means for heating it, and some way of getting the material from the tank into the mold. The particular means employed by complainant being a vessel with a spout like a coffee pot. 10

x-Q. 68. Is any one of the things just named by you dispensable, and if so, which?

A. Yes, the tea-pot might be omitted and the mold immersed in the wax-like material, and the separate top ring might probably be omitted.

x-Q. 69. With these possible or probable exceptions *all* of the things named in answer to x-Q. 67 are necessary, are they not, to constitute the "means" inquired of in x-Q. 67? 20

A. Yes.

x-Q. 70. Could a duplicate sound record obtained by the "means" just enumerated, be allowed to become completely set by reaching normal temperature, and then be subsequently reamed out by the employment with a suitable reaming-knife of chucks for holding the cylinder at the ends so as not to impinge upon its record-surface?

A. I do not know; I should imagine it could be done, but probably with a large percentage of breakage. 30

x-Q. 71. Are you familiar with the testimony given in these cases given by defendant's witness, Thomas H. Macdonald, particularly the portion where he refers to the "finishing" of defendant's molded sound record?

A. I read his deposition a couple of months ago but I do not recall distinctly what he said.

x-Q. 72. If a duplicate sound record should be 40



formed by pressing or expanding, under the influence of heat, an unmelted blank-cylinder within a tubular mold (for instance as described in the Defendant's Exhibit Edison patent No. 713,209) and while still warm and not yet disengaged from its mold, could its mold be used as a chuck with a straight edge reaming knife to ream out its interior,—or with the particular form of reaming knife shown in the Aylsworth & Miller patent in suit?

A. I think so, unless perhaps the expanding process might require so thin a cylinder initially that it would not stand any reaming which would leave it sufficiently strong.

x-Q. 73. Would the action of the reaming-knife, or the process of reaming, be any different in the case just inquired of from the action of the reaming knife and the process of reaming described in the two patents in suit?

A. No, assuming that reaming was permissible by reason of the presence of a sufficient amount of a record material.

x-Q. 74. Do you find that the particular "means" set out in the Aylsworth & Miller patent in suit, for forming the duplicate, in any way affects or modifies the action of the reaming knife, so as to cause it to act otherwise from what it would act under the supposition of x-Q. 72?

A. No.

x-Q. 75. Assuming that a cast or otherwise molded sound record obtained as, for instance, in the Edison patent No. 713,209, could after removal from its matrix be successfully reamed out as suggested in my x-Q. 70,—assuming that to be the fact would the action or operation of the "means" for forming that record (whatever they might be), be in any way affected or modified by the subsequent action of the reaming-apparatus or tool?

A. No.

x-Q. 76. In the second paragraph of your answer to Q. 9, you observe that the Edison patent No. 382,462, of May 8, 1888, contains no suggestion of how the molding was done. Why was this omitted?

A. I do not know why. Many patents are taken out on mere untried paper projects.

x-Q. 77. Considering that this patent No. 382,462 shows a hollow cylinder composed of wax-like composition, that these materials were well-known to be fusible, and that Mr. Edison says "I prefer to *mold* the entire phonogram-blank of the one wax-like compound \* \* \*" —would it be a violent assumption to understand that Mr. Edison contemplated that the person to whom the patent was addressed would read it as directing them to employ a cylindrical mold with a central tapering bore?

A. No.

Adjournd to Saturday April 18, 1908.

Met pursuant to adjournment.

Cross-examination of the witness BROWNE continued by Mr. Massie.

Present:

Counsel as before.

April 18, 1908.

x-Q. 78. In your answer to Q. 9 in the eighth paragraph thereof, you refer to the molding of glass bottles in the molds, and say "lettering on glass bottles is thus produced." How is this lettering produced, by what means or devices?

A. The interior of the mold is provided with reverse lettering so that the glass flows into or is blown into the same.

x-Q. 79. Was the same expedient well known



long before the date of Aylsworth & Miller date of application in producing lettering on metal castings?

A. Yes.

10 x-Q. 80. I understand your position with respect to claim 5 in suit of the Aylesworth & Miller apparatus patent to be that if this claim were merely for an apparatus for molding cylinder records and at the same time producing the lettering thereon, there would be nothing novel about it; but that because the lettering is produced in the particular place, namely, around the annular upper end of the cylinder, so that it can be readily observed, and will not take up room intended for the record-groove,—for this reason the claim in your opinion sets forth a novel device or apparatus which (also in your opinion) involves the quality of “invention.” Have I correctly stated your  
20 opinion?

A. Not quite. The latter part of your question beginning with the word “because” is correct. The first portion of the question is not correct, because, so far as that statement is concerned, I know of nothing in the prior art showing lack of novelty. On the other hand, as stated in my direct examination, it is unnecessary to consider whether or not such broad subject matter may or may not have been new, since no such subject matter is claimed  
30 in the patent. Hence, for the purposes of this case, such broad subject matter might well be conceded to be void of any quality of invention without affecting the actual subject matter of claim 5.

x-Q. 81. Are you aware of the fact that long before Aylsworth & Miller's filing date, it was the common if not universal practice in producing disc sound records to employ reverse lettering in connection with metallic reverse, so that the record-grooves and the lettering were simultaneously im-  
40

pressed upon the ultimate commercial article?

A. No.

x-Q. 82. Are you aware of the fact that for years before Aylsworth & Miller's filing date, it was a frequent practice to scratch or cut, or otherwise produce lettering around the annular end or top of the cylindrical sound record?

A. No.

x-Q. 83. In the ninth paragraph of your answer to Q. 9, you say "manifestly, the making of a sound record by *pressure* is not applicable to materials which must be rendered fluid before they can effectively conform to the sound record-surface \* \* \*." Why *must* the record-composition with which we are here dealing be of necessity rendered *fluid* before it can effectively conform to the sound-record surface? And, are you prepared to state as a matter of fact that the composition must in truth be rendered fluid before it can effectively conform to the sound-record surface of its mold? 10 20

A. As to the statement made by me in answer to Q. 9, it seems to me obvious that a material which is rendered liquid and is present in liquid form within a mold, cannot be effectively expanded by any internal pressure, such as is supplied by a mandrel, for example. Internal pressure is unnecessary because the fluid itself is competent to flow into and among the irregularities of its mold. 30

As to the second proposition in the question, which involves the fluid material itself conforming to the mold surface, my view is that it is impracticable if not wholly impossible for the material itself to perfectly conform to the interior surface of the mold unless it is in a liquid condition. I have never tried to find what the effect might be to introduce record material in a mold in a soft but not liquid condition and then letting it stay there to see what would happen. But, con- 40



sidering the fact that in all casting methods, with which I am familiar, either the material itself must be brought to liquid form or some external pressure must be brought to bear when the material is not in liquid form, I am of the opinion that one of the two plans must be adopted if any practical results are to be obtained.

10           The answer is objected to as not responding to the questions asked.

          x-Q. 84. Are you familiar with the decision of the United States Circuit Court of Appeals for the Seventh Circuit in the case entitled *National Phonograph Co.* against *Lambert Co.* rendered Aug. 1, 1905, and reported in Vol. 142 of the Fed. Rep. at page 164 thereof, to the effect among other things that the National Phonograph Company had produced from six thousand to eight thousand commercial duplicate phonograms by the pressing process of the Edison patent No. 713,209?

20

          A. I am not familiar with such a decision. I do not recall ever having seen the decision or that I ever had any knowledge or information that there was any such suit.

          Defendant's counsel gives notice that at the hearing of these causes defendant will refer to the above-entitled decision in the Federal Reporter; and asks complainant's counsel to accept the reported decision in lieu of his certified copy of the same, and of the decrees entered pursuant thereto.

30

          By Mr. Dyer: Counsel for complainants is willing that the decision as reported in the Federal Reporter shall be taken in lieu of a certified copy, subject to correction, but objects to any reference to this case by defendant's counsel on the ground that the said decision is incompetent, irrelevant and immaterial, and

40

the said cause was not between the same parties as the parties now in Court.

Defendant's counsel here calls attention to defendant's exhibit, Edison Deposition.

x-Q. 85. Resuming the subject matter of x-Q. 83. Is it not the fact that the ordinary cylinder-material of the period of Joyce's application (which I believe all parties agree is substantially the soap mixture of the Macdonald patent No. 606,725) could be used in making successful molded duplicate sound records, with a continuous or unsplit mold, by the pressing process of the Edison patent No. 713,209 (involving heat and pressure); so that it is not necessary, in order to make molded sound records that the material referred to *must* be rendered fluid? 10

A. I think compared with prior plans, earlier in date than the invention of the said Edison patent, that the pressing method of said Edison patent would produce records in a manner which comparatively speaking, were successful. Hence, I do not think it absolutely necessary to render the material liquid in order to get a useable record. 20

x-Q. 86. Referring still to the same passage from your answer to Q. 9, is it your meaning that in the specific casting process, (where the material has first been rendered fluid) it is not feasible to apply pressure introducing the duplicate sound record? 30

A. Yes, provided that pressure is an internal pressure.

x-Q. 87. What does the Joyce specification teach the public with regard to the application of internal pressure in producing duplicate sound records by his casting process?

A. He suggests that after the wax "has partly set" the tapering core may be screwed down so as 40



to give an expansive action. Manifestly, this could not be done while the material still is liquid, since such downward screwing would simply raise the level of the liquid.

x-Q. 88. In applying the *pressing* process (such for instance, as set forth in defendant's exhibit Edison Patent No. 713,209) is the application of heat made use of?

10

A. Yes.

x-Q. 89. To what extent should heat be applied in the pressing process; that is, what consistency must the blank cylinder be given?

A. I do not know what the limitations in practice may be. I should judge however, that the material would have to be brought to a plastic condition.

20

x-Q. 90. Assuming that by the *pressing* process molded sound records can be and have been obtained that the exact counterparts of the mold and exact and correct duplicates or copies of the original sound record, must not the plasticity imparted by the heat employed be sufficient to enable the material to enter perfectly into every irregularity of the matrix-surface of the mold?

A. Yes.

30

x-Q. 91. And on the same assumption, and with the same conclusion just stated by you, does the liquid (molten) material enter any more intimately or any more perfectly into the minute irregularities of the matrix-surface of the mold?

A. No.

x-Q. 92. Do you understand that Joyce was the first to disclose the fact that the shrinkage of the record-material was sufficient to effect a clearance between the casting and the mold, sufficient for us to take the casting out of the mold?

40

A. Yes, in case where the casting is formed by

introducing the material in liquid condition into the mold.

x-Q. 93. But before Joyce's date it was known, was it not, that if the material had been introduced into the mold in the form of an unmelted blank cylinder fitting more or less snugly in the mold, and the duplicate then formed by heat and pressure, then upon cooling the thus-molded duplicate would shrink sufficiently to be taken out without injury to its surface? 10

A. Based upon my own examination of the literature of the art I should say no. If there were any such knowledge, so far as I am advised, it was by Mr. Edison and I do not know to what extent the concession of priority by Mr. Joyce to Mr. Edison went.

x-Q. 94. Was it not known years prior to Joyce's date that you could melt that same cylinder composition, introduce it while still liquid into an unsplit smooth-bored cylindrical mold, and then when it had become cold, take it out of the mold, the radial contraction being many times greater than the maximum depth of any record groove found in actual practice? 20

A. No, not that I am aware.

x-Q. 95. In Q. 10, you refer to the precautions taken on account of the longitudinal shrinkage of the material. Does this behavior of the material and these precautions have any pertinence with regard to the patent in suit or any claims here sued on? 30

A. Yes, to the extent that the reproducing mechanism used with the cast record should have a pitch corresponding to the pitch of the cast sound groove.

x-Q. 96. Perhaps my question is not properly formulated. Do the patents in suit make any disclosure regarding this matter of having the orig- 40



inal records of different pitch, etc.; does the patent in suit contribute anything to that particular matter?

A. No.

10 x-Q. 97. And contrarywise, does the fact of the longitudinal shrinkage of the material and the consequent precaution taken with regard to the coarseness of the pitch of the original cut sound record, contribute anything to the novelty or patentability of any claims here in suit?

A. No.

Adjourned subject to agreement.

Orange, New Jersey, June 19, 1908.

Met pursuant to agreement.

Present:

20 HERBERT H. DYKE, Esq., for complainants.

C. A. L. MASSIE, for defendants.

Cross-examination of the witness BROWNE continued.

30 x-Q. 98. In former litigation between the parties to these suits (Nat'l Phon. Co. v. American Graph. Co., on Edison patent No. 713,209, pending in the District of Connecticut), Mr. Albert Wurth on April 28, 1904, testifying in West Orange, N. J., in rebuttal for said complainant National Phonograph Company, was asked the following cross-questions, and answered the same as follows, viz:

"214 x-Q. Does celluloid shrink enough on cooling it down to be disengaged from the sound-record grooves in a mold?

A. Yes, sir, it does.

215 x-Q. Does it have a less or a greater shrinkage than the ordinary wax compositions?

A. It has a greater shrinkage.

40 216 x-Q. So that there is no difficulty in

shrinking a celluloid record out of a mold after pressing it?

A. No, sir, there is no difficulty whatever."

Do you or do you not agree with this testimony given by Mr. Wurth?

A. Neither. I do not know what the action of celluloid would be under the circumstances, and hence cannot express any opinion as to whether Mr. Wurth is right or wrong.

x-Q. 99. In your answer to Q. 8 (in the fifteenth paragraph) you say that Lioret (U. S. Patent No. 528,273) does not get sufficient separation to slip the celluloid duplicate out endwise, but only sufficient to free the celluloid duplicate from the mold, so that the duplicate can be unscrewed from its mold. How much contraction is necessary to free a celluloid duplicate from its cylindrical mold without permitting it to be slipped out; and how much contraction of said cylindrical celluloid duplicate would be necessary to enable it not only to be freed, but also slipped out of its record-mold?

A. Lioret discloses a peculiar system of recording and reproducing sound. He starts with a screw-threaded cylinder, such as is shown in Fig. 1, and makes a record on it by vibrating through sounds a style in contact with the sharp apices of the screw threads, thus getting sound irregularities as indicated at b in Fig. 1. He then makes by a galvano plastic method a cylinder such as is shown in Fig. 5, having on its interior screw-threaded grooves and sound irregularities. He then puts a cylinder of celluloid c within the internally grooved cylinder, as indicated in Fig. 7. The whole is then plunged in hot water, thereby softening the celluloid ring which is thereupon forced outwardly by an internal mandrel, such as shown at a 2 in Fig. 8, thus causing the exterior of the celluloid ring to conform not only to the sound irregulari-



ties, but also to the original spiral screw thread.

The patent gives no data upon which any estimate of the amounts can be based. The drawings cannot be used as a criterion, because the specifications says:

10 "It may be further mentioned that the threads of the matrix are very fine in practice and are very much exaggerated in the drawings to facilitate the illustrations." (Page 2, lines 124-127.)

I do not know how deep the sound irregularities might be in Lioret's scheme of making them and have no basis on which I can make an estimate. I have no way of determining what Lioret intends when he says that the threads of the matrix are very fine in practice. He shows these threads much deeper than the sound irregularities.

20 The only thing which can be asserted with any plausibility is that he did not get shrinkage enough to remove the celluloid record endwise, because he says that after making the celluloid record:

30 "I then plunge the whole into cold water and the celluloid recovers its hardness and is at the same time generally contracted sufficiently to permit the easy withdrawal of the ring c from the mold a' by unscrewing it therefrom. If, however, the contraction of the ring c in this way is not sufficiently greater than that of the mold a', the mold may be slightly warmed by heat externally applied." (Page 2, lines 106-115.)

It seems from this that occasionally at least the shrinkage was insufficient to free the celluloid from the matrix, let alone permitting its endwise withdrawal.

In view of the foregoing I am not able to answer the question.

40 x-Q. 100. Can you assume the cylindrical record

mold of the usual dimensions, having the spiral record ribs of the usual height, and can you assume the average coefficient of expansion and contraction of celluloid, and then answer the foregoing question without any especial limitation to what Lioret may have to say on the subject? That is, with celluloid and such a record-mold, how will the amount of radical contraction compare with the depth of the record-grooves?

10

A. I could not make the assumptions mentioned, but they would be inadequate, because furnishing insufficient data. It would be necessary also to assume the depth of Lioret's screw threads and also to know the coefficient of expansion of the material of the matrix. Lioret dips both his matrix and the enclosed celluloid ring into hot water so that both are heated. Accordingly, lacking these necessary items, I am unable to answer.

20

x-Q. 101. The question was not limited to the Lioret patent. The coefficient of expansion of copper was well-known in 1894 and earlier, was it not; and the record molds known at that date were ordinarily copper, were they not?

A. Yes, as to the knowledge of the coefficient of expansion of copper. Whether or not record molds at the date of the Lioret patent were commonly exclusively of copper, I do not know.

x-Q. 102. In the former Connecticut litigation between the same National Phonograph Company and this defendant, on the Edison patent No. 667,662, Mr. Jonas W. Aylsworth, testifying for the complainant at West Orange, N. J., on October 8, 1903, answered x-Q. 111 in the affirmative, the question and answer being as follows:

30

"111 x-Q. Among the methods of making blanks with which you have been familiar is one which consists in pouring melted wax into a continuous cylindrical mold, allowing the wax

40



to solidfy, and then removing from the mold by withdrawing it longitudinally?

A. Yes."

In the same suit, and on the same date, in the course of his answer to Q. 43, where he was asked as to the changes in the processes of manufacture carried on by Mr. Edison's phonograph manufacturing concerns, Mr. Aylsworth said:

10

"Some time around about 1895 they began molding by withdrawing the blank from the mold while it was hot and in a semi-plastic condition."

Have you any reason to doubt these statements?

A. I know nothing whatever about the statements in question and have no reason either to doubt or believe them.

20

x-Q.102. In your answer to Q. 9 (11th paragraph) you speak of the "irregular unsymmetrical molding surface" of Joyce's mold. Please assume two parallel operations; in one you have Joyce's cylindrical record-mold and in the other you have a blank-mold having a smooth and polished cylindrical bore; and you have, in melted condition, the ordinary wax-like composition of the past ten years. The two molds are heated to the temperature indicated in the Joyce patent as the temperature for his mold, and each mold is filled with that molten material. The two are allowed to stand until the contents have solidified (and this may, if desired, be hastened in each instance by a cold water bath); and thereafter, when the contents have become set, the castings are withdrawn from the two molds.

30

What difference in behavior will there be; what difference in the amount of contraction radially; and what difference will there be in the processes carried out, and in the resulting articles?

40

A. There would be no difference in behavior and none in contraction.

The two processes differ only in the production of the differing molds.

The two products would differ, since one would be a sound record and the other a blank.

x-Q. 103. The second paragraph of your answer means, as I understand it, that the two processes differ because in the one instance you obtain as the result a sound record, and in the other you obtain as the result a blank cylinder; but that the steps taken in each process are identical? 10

A. No, the steps are not identical. One process involves the making of a mold with a smooth interior surface while the other process involves making a matrix mold with sound irregularities on its bore.

x-Q. 104. Then, in order to differentiate between the two instances, we have to include the step of making the respective molds as a part of the respective processes? 20

A. Yes.

x-Q. 105. Please assume the same parallel operations indicated in x-Q. 102—except that the record-mold is heated as already stated, while the blank mold is taken at normal temperature. Please state the differences in behavior, and in radial contraction? 30

A. I should have to make one other assumption, namely that where the record-mold is heated it is subsequently plunged into cold water for cooling, while in the other instance in making the blanks there is no such plunging in cold water. I am obliged to make these assumptions in order to bring the two contrasting processes within my knowledge.

On the basis of these assumptions, I do not know whether there would be sufficient contraction in the 40



case of the blanks to enable their withdrawal from the molds lengthwise. My experience and observations are limited to forcing the blanks out of the molds while still somewhat soft, so that a rough outer surface is produced which must be subsequently smoothed off with a lathe before a record is made thereon. So far as I know to the contrary, the shrinkage under such circumstances may involve a clinging of the blank material to the interior surface of the mold, the shrinkage, if any, manifesting itself by a shrinkage away from the center.

On the other hand, when the matrix mold with its sound irregularities is heated and it together with the cast cylindrical record material is artificially cooled by immersion in a bath of cold water, there is a preliminary setting of the record material against the matrix surface, followed by a shrinkage of the material, so that it can be subsequently withdrawn endwise from the matrix. There is produced a sound record having a smooth and polished surface, except for the accurately reproduced sound groove. Hence to sum up the matter in making the blanks, I do not know that there is any radial contraction of the blank as a whole, whereas, in making the sound records, there is a final radial contraction sufficient to enable the sound records to be withdrawn. In making the sound records the material behaves in the manner which I have stated and I have no knowledge that such behavior occurs in the making of the blanks.

x-Q. 106. Assuming the same parallel instances already inquired of; remembering that in each instance we have the same composition which has, of course, a more or less definite coefficient of expansion and contraction. And recalling that in each instance the ultimate temperature of the casting is the same, this having been reached gradually in the case of the blank, while it has been hastened

by the cold water bath in the case of the record, does the application of the cold water bath increase the actual amount of contraction?

A. I do not know and am not advised as to what the exact behavior of the blank might be when made as suggested. Materials of this character have different behaviors under different conditions. Analogous instances are shown in the manufacture of candles, which has been referred to in the record. I know that when the mold is heated and it together with the cast composition are immersed in cold water that there is a preliminary clinging of the cast material to the matrix surface which is probably a material factor in producing the final polished surface and the faithful reproduction of the sound groove. This is followed by the radial contraction which is sufficient to permit endwise withdrawal. I think it probable that the metallic matrix mold loses its heat much more rapidly than the record composition, and if this is so, then when both are plunged in cold water the contraction of the record mold would be more rapid than that of the cast composition; and this may be largely instrumental in effecting the quality and character of the sound surface of the sound record.

In any event, I cannot compare this behavior with the assumption concerning the making of blanks, since my own knowledge of blank making is when the blanks are pushed out by still clinging to the mold and while still warm and soft, so that an unfinished surface is produced. Whether or not this would be the case if allowed to cool I do not know.

Whether or not the plunging in cold water results in more or less radial contraction of the cast record as a whole I do not know.

x-Q. 107. Joyce was not the first to use a continuous (that is, unsplit) cylindrical record-mold,



was he? I refer for instance, not only to the Lioret patent No. 528,273, and the Young British patent, but also to Mr. Edison's pressing process, as set forth, for instance, in the Edison patent No. 713,209, which I will remind you was allowed after an interference with Joyce, in which the latter conceded priority?

10     A. No, I believe that Joyce was not the first to use a continuous metallic cylindrical matrix mold for making duplicate sound records.

20     By Mr. Massie: Defendant's counsel gives notice that at the hearing the Court will be referred to the decision of the Court of Appeals for the Seventh Circuit in National Co. against Lambert Co., reported in Vol. 142, of the Federal Reporter at page 164, reference being made particularly to the mention beginning at the bottom of page 165 thereof, to the testimony of Mr. Edison, as to the practice of the pressing system in making duplicate sound records from cylindrical molds.

30     Complainant's counsel agrees to the use of the report in the Federal Reporter instead of the official record of this case, but objects to any reference to the decision named by defendant's counsel on the ground that the parties to that suit and the issues decided therein are different from the parties and the issues in the present suits.

40     By Mr. Massie: Defendant's counsel relies upon that reported decision not as *res adjudicata* with reference to the present litigation, but as an admission by the National Phonograph Company and by Mr. Thomas A. Edison that the pressing process substantially as disclosed in the Edison patent No. 713,209 was practiced in this country as early as 1891; and as an admission by the same parties that the duplicate sound records obtained thereby were perfect as far as quality was concerned; an ad-

mission that the said process was carried out successively.

Counsel for complainants renews his objection to the use of the decision named as reported in the Federal Reporter for the purposes contemplated or for any purpose whatever on the grounds already given.

x-Q. 108. In your answer to Q. 9 (paragraph 3) you refer to the Joyce invention as representing "a turning point in this art," and you add: "practically, the old method has been superseded, and commercial duplicate records are to-day made by casting molten material in a continuous mold."

Do you regard the process set forth in the Miller & Aylsworth, and Aylsworth and Miller patents here in suit as coming within the language last quoted by me? And, if so, in your opinion is the process of making duplicate records, as set forth in those patents, the process which you regard as the Joyce invention?

A. Yes, as to the first branch of the question, and no, as to the second.

x-Q. 109. Then, if it should be assumed that prior to Joyce's date, the world had not succeeded in obtaining duplicate sound records, by *casting*, from *unsplit* cylindrical molds; and if now the world has learned how to do this; yet Joyce (in your opinion) discloses one means of getting the result, while the two Miller & Aylsworth patents disclose another and independent and distinct means?

A. Yes.

x-Q. 110. In other words, am I right in saying that Joyce does not disclose the only way of accomplishing that result, viz., obtaining duplicate sound records, by *casting* from an *unsplit* cylindrical mold?



A. Yes.

x-Q. 111. When we speak of an invention being a turning point in the art, and refer to the results accomplished, it would seem to indicate that previous investigators had encountered difficulties and obstacles and the "turning point" invention had removed or gotten around those obstacles.

10 I understand that among the difficulties or obstacles encountered in producing duplicate sound records by molding from an unsplit mold (whether specifically by pressing or by casting) was the liability to entrap air bubbles, and perhaps also some peculiarity in shrinking. If I am correct, please state by what means the Joyce specification overcomes or removes such objection? And, also, by what means the Miller & Aylsworth patents overcome or remove such objection?

20 A. I do not know that the objections stated have been encountered prior to the patents in suit. Also, I do not think the initial proposition made in the question is invariably true.

x-Q. 112. What then did you mean when towards the close of the third paragraph of your answer to Q. 9, you said "The Joyce invention represents a *turning point* in the art?"

30 A. I understand that the practical commercial way of making duplicate sound records prior to Joyce was by the duplicate engraving machines. Since the date of Joyce's invention the practical commercial way is to cast the molten sound record material in a continuous cylindrical mold. This change from one plan to the other I regard as a turning point in the art.

40 It does not seem to me that the quality of Joyce's invention is affected by the proposition as to whether he knew of the objections to the old duplicating method or not; or whether he had encountered any difficulty himself in making cast records.

Assuming, for illustration, that Joyce had no knowledge of how duplicate records had been made, and that he succeeded the first time trying, I do not think that the quality of his invention would have been affected.

x-Q. 113. Referring to the first paragraph of your answer non-constat that the practical commercial way now employed is Joyce's invention. Assuming that before the date of Joyce's invention, the commercial manner of making duplicates was by means of the duplicating machine, such as in the Macdonald duplicating patent No. 559,806 (named by you near the end of Q. 7), it is also the fact that since the date of Joyce's invention, complainant's have been making duplicate sound records in a practical commercial way by means of the process of the Miller & Aylsworth patent, which is separate and distinct from Joyce's invention. Is this statement correct? 10 20

A. Yes.

x-Q. 114. Can you state wherein in your opinion the "Joyce invention" involves the achievements of such quality as to rise to the dignity of "invention?"

A. He did something to promote the progress of the phonographic art. Prior to him there was no known commercial way of making duplicate sound records by casting molten record composition into a continuous hollow cylindrical matrix. He discovered that this could be successfully done by having both matrix and material hot when the material was within the matrix and by then immersing both in cold water. Since then commercial duplicate sound records have been chiefly made by the casting method. This was new and useful, and hence involved invention. 30

The fact that Joyce did not discover the only way in which the casting operation could be per- 40



formed and did not get a claim sufficiently comprehensive to cover all ways, does not detract from the quality of his invention. Miller & Aylsworth have since discovered a specifically different way of accomplishing the same results, but this does not detract from the merits of the Joyce performance.

10 x-Q. 115. I understand your position to be that specifically defendant's process differs from that claimed by Joyce in that Joyce pre-heats his mold, whereas defendant does not; but that in your opinion these two specifically differing processes are *equivalents*. And that there is no valid reason in the prior art why the doctrine of equivalence should not be invoked in favor of the Joyce patent. Have I correctly stated your views?

20 A. Yes, so far as your statement goes. I do not think it necessary, however, to consider the question of equivalence in view of the language of the pertinent claims of the Joyce patent, which say nothing about any pre-heating of the mold.

x-Q. 116. In giving your answer and in your answer to Q. 7, have you considered the file wrapper and contents, particularly the matters pointed out in the Massie deposition in regard to the statements made in the prosecution of the Joyce application, concerning pre-heating?

A. Yes.

30 x-Q. 117. Please assume that in order to obtain a successful result in casting duplicate sound records when the material is introduced into the top of the cylindrical mold, that it is absolutely essential that the mold and its contents must be heated to a considerable temperature (say 150°F.) above the melting point of the composition. Making this assumption, please point out where, if at all, the Joyce specification makes such a disclosure?

40 A. It is a little difficult for me to make an assumption which I know is not true, which is con-

trary to my own observation. It seems to me like inquiring how one could skate if ice was heavier than water. Nevertheless, making the assumption, then the Joyce patent does not state that the temperature should be any particular number of degrees Fahrenheit above the melting point of the composition, and certainly does not make a statement as to 150°F.

x-Q. 118. I will modify my hypothetical question. Assume that the court should find from the evidence in these cases that in making cast sound records, where the material is poured in at the top that the temperature of the material and of the mold should be about from 70 to 90 degrees F. above the melting point of the material. Where, if at all, does the Joyce patent contain any such teaching? 10

A. It does not contain any specific statement of temperature. It simply states that the mold should be "heated, preferably, to near the temperature of melted wax," (page 1, line 102). It also refers to the mold as being "hot" (line 105, page 1) and in several of the claims. 20

"Near the temperature of melted wax" is perhaps ambiguous. It may mean either above or below the point at which the wax melts; or it may mean that it should be either above or below the temperature of the mass of molten wax. In either event the suggestion is that the temperature should be some where near the selected criterion. Without having any other guide, therefore, in practicing the process the artisan would try all four of the suggested temperatures. If he succeeded with any one (assuming that there was only one at which he could succeed) the disclosure is adequate. As a practical matter, the temperature of a bath of molten wax varies. As I recall, the record composition reaches a fluid molten condition at about 290°F. 30 40



In order to maintain it certainly fluid, it would be reasonable to maintain the temperature above that, say, in the neighborhood of 320 or 330 degrees. Just as when an ice cream maker freezes cream, he employs something materially below the freezing point of the cream.

10 Now, if a person trying the Joyce method found that he had gotten his best results by having the temperature of the mold near the temperature of the melted wax, and that that desirable temperature was as high as three hundred and sixty degrees or 375 degrees Fahrenheit, I would consider that that excess was fairly within the meaning of the language used in the Joyce specification. I have selected the stated temperatures because they would fall within the excessive temperature above the point at which the wax becomes molten, given in your question. Therefore, I should say under  
20 the assumption of the question that while the Joyce patent does not state temperatures in degrees Fahrenheit, yet, it is reasonably deducible therefrom that a temperature from 70 to 90 degrees Fahrenheit above the point at which the composition becomes fluid through heat should be used.

By Mr. Massie: Defendant does not accept as correct the statement as to the adequacy of the disclosure when the artisan has to resort to selective experiments.

30 x-Q. 119. Please assume that the Court should construe the Joyce patent as directing us to heat the composition to a temperature only a few degrees above its melting point, and to pre-heat the mold to just a few degrees below the temperature first indicated, so that the mold and the wax are of substantially the same temperature. Upon this assumption if a mold be heated to a temperature 30° F below the melting point of the composition, and  
40 the latter be heated to a temperature 70° above its

melting point, and thereafter the material be introduced into the mold, chilled, withdrawn, etc.; has the process of the Joyce claims in suit been carried out?

A. Yes. Even assuming that the Court should make this specific finding as to the disclosure, there would be no justification in tying the patent rigidly down to the specific degree, since the specification does not so tie it down, and the assumption involves, as I understand, that records could be cast and properly obtained if there should be the difference of a hundred degrees between the mold and the composition.

10

There is nothing in either specification or claims restricting either the temperature of the melted wax or the temperature of the mold to any specific degree.

The Joyce patent refers to the pouring of the melted wax, thus involving the wax being at a pouring temperature and containing absolutely nothing to restrict the wax as to specific temperatures, so that a still higher temperature would be excluded.

20

So likewise with the temperature of the mold. It is enough that it should be near the temperature of melting wax, no matter how that language may be construed.

Therefore, for these reasons, I think the specific inference assumed in the question would be a practice of the Joyce method.

30

x-Q. 120. Assume that the wax is at a temperature of say 450 or even 425 degrees F., and the mold at normal temperature of about 70° F; and that on account of its greater specific capacity for heat, the wax should raise the temperature of the mold to say 225 degrees F. (the melting point of the wax being 290° F.) has the process of the Joyce claims been carried out?

40



A. I do not know. I should have to test the proposition before reaching a conclusion.

10 x-Q. 121. Do I state your views correctly in the following propositions: The process of the Joyce patent calls for a hot mold, but it is immaterial whether the mold be pre-heated or heated by the introduction of wax. In any case, the two must be "of substantially the same temperature." And the quoted words, the amount of difference of temperature permissible to fall within the claimed process, cannot be ascertained from the patent itself, but would depend upon whether or not the results were useable sound records?

20 A. No. On the contrary, I think the permissible temperature can be obtained from the patent itself. On the other hand, the patent does not state any limits of temperature beyond which the process would not be feasible or practiced. I presume that the heat of the mold might be increased or diminished beyond useable temperatures and likewise with respect to the wax.

The patent states the conditions under which the process can be successfully practiced, but does not state the conditions under which it cannot be successfully practiced. That would have to be found out by experiment.

30 x-Q. 122. What I am getting at is this. In pouring super-heated wax into a so-called cold mold, the temperature of that mold will be raised. Now to what maximum amount can the temperature of the mold be raised without infringing the Joyce claims here in suit?

A. I do not know. I should have to experiment to reach a conclusion.

40 x-Q. 123. Please consider the Aylsworth & Miller specific apparatus and the Miller & Aylsworth specific process (subordinating as far as possible the reaming knife and its use, so as to consider

only the formation of the duplicate record). Can the Aylsworth & Miller apparatus of Fig. 1 be used in producing duplicate sound records, except in accordance with the Miller & Aylsworth process? In this question, I am not referring to any matter of scope of the claim, but to the apparatus and process as specifically described.

A. No.

x-Q. 124. In like manner, I ask you if the specific process disclosed in the Miller & Aylsworth patent could be carried out except by using a mold having its bottom opened and having its exterior protected from heat? (as in the apparatus of Fig. 1 of the Aylsworth & Miller patent.) 10

A. I know of no other way of carrying out the specific process.

x-Q. 125. Can the specific process of the Miller & Aylsworth patent be carried out by the devices shown in the drawings in the Macdonald reissued patents No. 12,095 and 12,096 in evidence herein? 20

A. No.

x-Q. 126. Can the specific process employed by defendants be carried out by the specific apparatus shown in Fig. 1 of the Aylsworth and Miller patent?

A. No.

x-Q. 127. Can the specific process employed by defendant be carried out by the specific apparatus shown by the Macdonald reissue patent just inquired of? 30

A. I do not know.

Mr. Massie announces that the cross-examination of Mr. Browne is closed.

Adjourned to 10:30 A. M. June 20, 1908.



## RE-DIRECT EXAMINATION.

Orange, N. J., June 20, 1908.

Met pursuant to adjournment.

Parties present as before.

Re-direct examination by Mr. DYKE:

10 Rd-Q. 128. In making your answers to x-Q. 124,  
x-Q. 125 and x-Q. 126, did you consider that the  
assumption of x-Q. 123 was carried forward into the  
succeeding question?

By Mr. Massie: Defendant's counsel intended the same assumption to be carried forward into the three succeeding questions.

A. Yes.

20 Rd-Q. 129. In your answer to x-Q. 30, you stated  
"I have tried the Joyce process in connection with  
the old composition with successful results." Did  
you keep any of the records made at that time?

A. Yes. I here produce a record then made out  
of the ordinary soap composition.

The record produced by the witness is introduced in evidence and marked "Complainants' Exhibit, Record Made from Ordinary Blank Composition by Commercial Joyce Process."

30 By Mr. Massie: The exhibit is objected to  
as not relevant or pertinent, since the process  
the witness has described in connection with  
the exhibit, is not the process described in the  
Joyce patent in suit. And the title given the  
exhibit is objected to as misleading on the same  
grounds.

Rd-Q. 130. From what source did you obtain the  
material from which this exhibit is made?

40 A. It was taken from the tank of material which  
was then being used in making blanks in the ordinary  
course of business in complainant's factory.

Rd-Q. 131. Mr. Massie asked you (x-Q. 34) "in the test made by you did you slightly oil the mold and the core?" To which you replied that you did so on one occasion. Have you preserved any of the records made where the mold was oiled?

A. Yes, and I here produce it.

The record produced by the witness is offered in evidence and marked "Complainants' Exhibit—Record Made after oiling the Mold and Core." 10

By Mr. Massie: The objections are repeated.

Rd-Q. 132. From what source did you obtain the material from which this material was made?

A. It was from the tank containing the molten material then being used in the molding of master records in the ordinary commercial practice of complainant's factory. 20

Rd-Q. 133. Did you make any additional records at that time which you have retained?

A. Yes, I here produce another record made at that time.

The record last produced by the witness is introduced in evidence and marked "Complainant's Exhibit—Third Joyce Record."

By Mr. Massie: The title is objected to as misleading and the exhibit is objected to as without pertinence or relevancy. 30

Rd-Q. 134. From what source did you obtain the material for making this record?

A. From the vat of material used in the commercial manufacture of master records.

Rd-Q. 135. How, if at all, do you identify the records above introduced into evidence?

A. I identify the light colored record "Complainant's Exhibit—Record made from Ordinary Blank Composition by Commercial Joyce Process" 40



by its color.

I identify "Complainant's Exhibit—Record Made After Oiling the Mold and Core" because it was made in "Complainant's Exhibit Commercial Joyce Apparatus," the record cylinder of which is marked "Dancing with Ma Baby," and on placing the record in a phonograph, this title is audibly sounded.

10 I identify the remaining exhibit "Complainant's Exhibit Third Joyce Record," because I preserved these three records, and this is the third one.

Re-direct examination closed.

Recross examination by Mr. MASSIE:

Rx-Q. 136. What have you to say, if anything, as to the surface appearance of the three records just introduced as indicating the presence of oil?

20 A. The black records have a more polished appearance than the light colored one. It seems to me that the black record made with the oiled mold has a more polished appearance than the other, though the difference is not marked. Both may be somewhat dulled since originally made, but when both were freshly made from the oiled mold they seemed to me to be appreciably more polished in appearance.

30 Rx-Q. 137. The one of the two black ones which to your eye appears the most polished of the three is the article having squared ends and not beveled at either end, which is identified as "Record Made After Oiling Mold and Core." While the "Third Joyce Record" (having one end somewhat beveled) is to your eye more polished than the white record?

A. Yes.

Deposition closed.

ARTHUR S. BROWNE.

Certificate waived.

## STIPULATION, JUNE 23, 1908.

It is stipulated and agreed by and between the parties to these suits that the Edison Phonograph Works, from a period earlier than 1895 and during the years 1895, 1896, 1897 and 1898, made cylindrical sound-records and also blank cylinders for recording purposes, from a composition substantially that disclosed in formula B in the Macdonald patent No. 606,725, and sold and offered the same for sale throughout the United States during that period; and that during the years 1895, 1896, 1897 and 1898 the defendant manufactured cylindrical sound-records, and also blank cylinders for recording purposes from substantially the same composition, which were sold and offered for sale throughout the United States during that period, by the Columbia Phonograph Company, the sales agent of defendant; and that any records or blanks, or pieces of records or blanks, which were obtained by Maurice Joyce from the store of the Columbia Phonograph Company, at Washington, D. C., within that period, were made from the said composition; but that the composition itself was not otherwise for sale and was not otherwise sold (except in the form of sound-records and blank cylinders); and that the nature of the said composition and the process of manufacturing the same were not known to the public and were first disclosed to the public upon the issuance of the said Macdonald patent No. 606,725, on July 5, 1898.

FRANK L. DYER,  
Of Counsel for Complainants.

C. A. L. MASSIE,  
Of Counsel for Defendant.

10

20

30

40

-Record Made  
because it was  
mercial Joyce  
hich is marked  
lacing the rec-  
dibly sounded.  
Complainant's  
se I preserved  
bird one.

E:  
y, if anything,  
three records  
sence of oil?  
e polished ap-  
It seems to me  
oiled mold has  
other, though  
y be somewhat  
hen both were  
hey seemed to  
in appearance.  
uck ones which  
ed of the three  
ad not beveled  
"Record Made  
ile the "Third  
ewhat beveled)  
white record?

BROWNE.



## UNITED STATES CIRCUIT COURT,

SOUTHERN DISTRICT OF WEST VIRGINIA.

	NATIONAL PHONOGRAPH COMPANY	} <i>In Equity on Letters Patent No. 683,615.</i>
	vs.	
10	AMERICAN GRAPHOPHONE COM- PANY.	

	NATIONAL PHONOGRAPH COMPANY	} <i>In Equity on Letters Patent No. 683,676.</i>
	vs.	
20	AMERICAN GRAPHOPHONE COM- PANY.	

	NEW JERSEY PATENT COMPANY	} <i>In Equity on Letters Patent No. 831,668.</i>
	vs.	
30	AMERICAN GRAPHOPHONE COM- PANY.	

Complainants' testimony in rebuttal, taken pursuant to notice at the office of Robert Fletcher Rogers, 45 Broadway, New York, N. Y., on December 8th, 1908, at 2 o'clock P. M., before John L. Lotsch, Notary Public, in and for the State of New York and Special Examiner by consent of counsel.

PRESENT: Herbert H. Dyke, Esq., on behalf of complainants; C. A. L. Massie, Esq., on behalf of defendant.

U. S. CIRCUIT COURT,

CITY OF WEST VIRGINIA.

COMPANY  
NE COM- } *In Equity on  
Letters Patent  
No. 683,615.*

COMPANY  
NE COM- } *In Equity on  
Letters Patent  
No. 683,676.*

COMPANY  
NE COM- } *In Equity on  
Letters Patent  
No. 831,668.*

ony in rebuttal, taken pur-  
office of Robert Fletcher  
New York, N. Y., on Decem-  
ock P. M., before John L.  
n and for the State of New  
iner by consent of counsel.

H. Dyke, Esq., on behalf  
L. Massie, Esq., on behalf

By Mr. Massie:—

Defendant's counsel objects to the taking of any further rebuttal testimony at this time, on the ground that the time for taking rebuttal testimony herein has expired, and that complainants' proofs are already constructively closed. The attendance by defendant's counsel is without waiver of this objection and any cross-examination will be *de bene esse* only.

10

Complainants' counsel replies that the rebuttal proofs in these cases have not been closed and that the times heretofore set by order of the court for taking testimony in these cases have been extended by consent of counsel, defendants' answering testimony having been taken subsequent to the time so set by virtue of such stipulation, and that the time for taking rebuttal testimony has not, therefore, expired.

20

#### DEPOSITION OF ROBERT FLETCHER ROGERS.

ROBERT FLETCHER ROGERS, a witness produced on behalf of complainants, being first duly sworn, deposes and says in answer to interrogatories propounded by Mr. Dyke, as follows:

Q-1 Give your name, age, residence and occupation?

A Robert Fletcher Rogers, attorney at law, 45 Broadway, New York City, legal age.

30

Q-2 Have you an acquaintance with Mr. Maurice Joyce, the printer and engraver of Washington, D. C., who has testified in these suits?

A I believe I met Mr. Joyce, or had some communication with him some years ago.

Q-3 Do you remember having had any communication with him respecting any duplicate phonograph records?

40



A I remember at one time at the instance of Mr. Stilson Hutchins, of Washington, D. C., having some communication with Mr. Joyce, and at his request I sent or delivered to Mr. Easton, of the American Graphophone Company, a record which he wished to be passed upon by that company. The best of my recollection is that this record was subsequently returned to me.

Q-4 Where is that record now, if you know?

10 A To the best of my knowledge and belief, I have it here and now produce it. I think it was not returned to Mr. Joyce and that it has been in the office here since that date. I now produce a record which I believe to be the one in question.

The record produced by the witness is introduced in evidence and the Examiner is requested to mark the same "Complainants' Exhibit, Early Joyce Record."

20 By Mr. Massie:

The exhibit is objected to as irrelevant and immaterial and as not sufficiently identified. It is further objected that the designation given it by complainants' counsel is without proper basis.

Q-5 I hand you two papers and ask you to state what these are, if you know?

30 A These two papers which are marked respectively "Complainants' Exhibit, Easton's Letter to Rogers, July 9, 1898," and "Complainants' Exhibit, Robert Fletcher Rogers's letter to Joyce, July 5, 1898," are unquestionably a portion of the correspondence in the transactions I had at the time. I clearly identify the exhibit marked "Complainants' Exhibit, Robert Fletcher Rogers' Letter to Joyce, July 5, 1898," as a letter signed and unquestionably sent by me to Maurice Joyce, whose name appears thereon, and I recognize the other exhibit marked "Complainants' Exhibit, Easton's  
40 Letter to Rogers, July 9, 1898," as a portion of the

same transactions. I have a distinct recollection that such a letter was sent to me by Mr. Easton, and its inspection at this time amply confirms my recollection, although I should not have been able to have stated its precise contents without having seen it. I do recollect, however, without seeing the letter that its general trend was the same as that set forth in the letter.

Q-6 Have you any further records relative to this transaction of which you know? 10

A I do not know of any such records at the present time and regard it as doubtful. It is possible that there may be some letters in my files, but I regard it as improbable, for the reason that it was not a matter I was very much interested in, either professionally or in any other way.

Q-7 Do you consider that if such records were found they would add anything to the record of the transaction? 20

By Mr. Massie:

Objected to as incompetent.

A My belief is that the two letters which you showed me indicate very clearly precisely just what occurred at the time. My recollections of the matter correspond to this showing. Of course, I could not say what other letters might show, but I regard it as very doubtful that there are any other letters. The mere fact that I sent the original Easton letter to Mr. Joyce would indicate that it was not a matter in which I was very much interested. 30

Q-8 Will you please examine your files and ascertain if you have there any further correspondence relative to this matter?

A (Witness examines files). I have examined my files and find a letter dated July 5, 1898, written to me and signed by Andrew Devine, which let- 40



ter is largely personal, and relates to other and confidential matters. This letter is dated Madawaska Island, Ivy Lea Postoffice, Ontario, Canada. The only pertinent matter therein is in the following words:

10 "By this mail I write to our office about the Misco business and the Joyce Cylinder, and if you do not hear from there in a day or two, please go down and see Mr. Smith or Mr. Cromelin or Mr. Easton. Of course I would like to be present at the exhibition or exhibitions, but the others can judge at least as well as I could."

I do not recollect clearly to what the last sentence refers, or whether he means the exhibitions of the Misco business or of the Joyce cylinder. In fact, I do not recollect what the "Misco" business was.

20 By Mr. Massie:

The answer is objected to, particularly the quotation of the Devine letter, as irrelevant and immaterial, and as incompetent as being only part of the correspondence.

(The witness continues). This is all that I have been able to find at the present time.

Q-9 Who is Andrew Devine, from whom you received the letter out of which you have read an extract?

30 A Andrew Devine is an old friend of mine, and was formerly president of the National Typographic Company, of which company I am now president. At the time in question I was the company's attorney, and the letter for the most part relates to company business. He was at one time one of the vice-presidents of the American Graphophone Company, and a director for a long time. Just what his connection is with that company at the present  
40 time I have no means of knowing.

Q-10 Have you looked for the letter referred to in your letter to Joyce, which is in evidence herein, as his letter of the "29th ult.," to which your letter appears to be an answer?

A I have looked for it as far as I can. I have not been able to find it in any of the files which I thought would most likely contain it.

Direct examination closed.

10

CROSS-EXAMINATION by Mr. Massie, without waiving the objections already entered.

XQ-11 Is it not a fact that the two exhibit letters and the Devine letter set forth practically all that you recollect concerning this Joyce transaction, and that you recollect nothing beyond what appears in those three letters?

A Substantially nothing more than that. I have a recollection that the cylinder was to be formed in a master matrix, but I am unable at this time to give you the details of the process. 20

XQ-12 Are you able to state as a fact whether or not the cylindrical article which you have produced in your direct examination is a sound record?

A To the best of my knowledge and belief it is; I have never seen it used or tested on a sound reproducing instrument, but it certainly has the appearance of such a cylinder. 30

XQ-13 Are you able to state positively that this article which you produce this afternoon is the very same identical article that you received from Mr. Joyce?

A To the best of my knowledge I believe it is the cylinder which I received back from Mr. Easton, but whether or not Mr. Easton returned me the same cylinder or not, I cannot, of course, swear, as I had made no identifying marks upon it. Of 40



course, I do not mean to imply that in any way Mr. Easton would have sent me another cylinder in return.

Deposition closed.

Signature and certificate waived.

STIPULATION, APRIL 20, 1909.

10 It is further stipulated and agreed between the parties as follows: That David W. Dodd, if called as a witness for complainants, would testify that he has had charge of the Wax Departments of complainants for more than three years last past, and is and has been familiar with the materials and processes there used, and that the blank cylinders, employed by complainants for engraving original sound records thereon, are made from a composition set forth in Formula B of the patent to Macdonald, No. 606,725, July 5, 1898, and that it was this composition that complainants' witness, Browne, obtained in making a sound-record referred to by him in answer to redirect questions 129 and 130.

20 The parties, by their counsel, further stipulate and agree that Frank L. Dyer, if called as a witness in behalf of complainants would testify as follows:

30 I live in Montclair, New Jersey, and am General Counsel for the complainant companies, New Jersey Patent Company and National Phonograph Company, having acted in this capacity since the early part of the year 1903. I have had charge of Mr. Edison's patent litigation and other patent matters since 1897. I am thoroughly familiar with all the suits between the National Phonograph  
40 Company and allied companies on the one hand,

and the American Graphophone Company and other companies allied therewith on the other hand.

# I.

In recent years, this litigation has related to phonograph records and compositions and to processes and apparatuses for use in the manufacture thereof.

10

Mr. Mauro has testified that there have been eight such suits which have been brought by the National Phonograph Company and companies allied therewith against the present defendants and their selling agent, the Columbia Phonograph Company, General, including these three suits in the Southern District of West Virginia, and I think that the brief history given by him of these eight suits is correct so far as it goes. I cannot see what any other cases than the ones now on trial have to do with the issues to be decided by the court, but it may be worth while to call attention to the fact that not all such litigation between these rival interests, has been instituted by the National Phonograph Company, for within the last four years there have been three such suits brought by the defendant against the National Phonograph Company. These suits are as follows:

20

1. American Graphophone Company vs. National Phonograph Company, on Macdonald composition patent, No. 606,725, District of New Jersey, bill filed on April 1, 1905. On June 12, 1908, bill dismissed by consent.

30

2. American Graphophone Company vs. National Phonograph Company, on Macdonald composition patent, No. 626,709, District of New Jersey, bill filed on April 1, 1905. On June 12, 1908, bill dismissed by consent.

40



3. American Graphophone Company vs. National Phonograph Company, on Macdonald reissued patents, Nos. 12,095 and 12,096, District of New Jersey, bill filed on April 23, 1908. A motion for preliminary injunction and supporting affidavits were filed by complainant with the bill, and answering affidavits were filed on June 1, 1908. Complainants have never pressed this motion for preliminary injunction, and have virtually abandoned it.

Both the suits above numbered, 1 and 2, were dismissed by consent, at the same time that the *single* suit of the New Jersey Patent Company vs. Columbia Phonograph Company, General, also in the District of New Jersey, which is No. 7 in Mr. Mauro's list on page 231 of the printed joint record in the present suits was dismissed by consent.

## II.

The patent to Mr. Edison No. 713,209 sued on in suit No. 1103 in the U. S. Circuit Court of the District of Connecticut, which, with suit No. 1076 in the same court on Edison Patent No. 667,662 (Nos. 2 and 1, respectively, in Mr. Mauro's list), have been referred to by Defendant's witnesses, Mauro and Massie, as "the Connecticut cases," was for an expanding or pressing process. In the process disclosed in that patent a metal matrix is first formed upon a master record. The master record having been removed, a hollow blank cylinder of wax-like material turned to accurately fit the bore of the matrix, is introduced therein. This blank is then expanded by heat or by pressure applied by means of a tapered core in order that it may receive an impression from the interior surface of the matrix, after which it is contracted by chilling to clear the interlocking surfaces and withdrawn longitudinal-

ly from the matrix. There is no disclosure or suggestion in that patent of a casting process of any kind.

Following a description of the method of obtaining the matrix the process is described in the patent in the following terms (Patent No. 713,209, page 2, lines 4-69):

Having obtained a suitable matrix carrying a negative representation of the original phonographic record to be duplicated, I proceed with the duplication of the records as follows: The blanks which are to receive the duplicate records are preferably composed of a material having a higher coefficient of expansion than that of the matrix or mold, and said blanks are made sufficiently thick to maintain their shape during and after the act of disengagement from the matrix, as will be explained. The blank under normal temperatures is of a diameter very slightly less than the bore of the matrix or mold, whereby the blank may be inserted in the same. After the blank has been thus placed within the matrix or mold both the matrix and the blank contained therein are, or the blank alone is, brought to a higher temperature, whereby the blank will expand and will be brought into intimate contact with the record-surface of the matrix or mold, whereby the negative record thereof will be impressed with absolute accuracy upon the surface of the blank. The expansion of the blank into this intimate engagement with the interior of the matrix or mold may be effected in any suitable way, such as by maintaining the matrix or mold, with the blank contained therein, in a heated atmosphere. By making the blank of a material having a higher coefficient of expansion than the matrix or mold the blank will be properly expanded to receive the impression of the record, notwithstanding the fact that both the blank and the matrix or mold may be subjected to the same temperature.



1  
10 In order to facilitate the operation and make the resulting duplicate record somewhat sharper, I prefer to introduce a tapering mandrel within the blank after the blank has been placed in the matrix or mold and heat applied to the blank, as explained, and to force the mandrel tightly within the blank after the latter has been expanded into engagement with the record, whereby the blank will be further expanded mechanically into absolute intimacy with the record, after which the mandrel will be immediately withdrawn. With blanks made of sufficiently viscous material the entire expansion may be effected mechanically by forcing a tapering mandrel within the same.

20 After the blank has been expanded, so as to receive the impression of the matrix or mold, it is removed by first shrinking it radially in any suitable way, as in a refrigerating chamber, and by then withdrawing the resulting duplicate by a direct longitudinal movement. Owing to the shallowness of the phonographic-record groove this radial shrinkage of the duplicate record effects a sufficient separation of the surfaces of the matrix and of the duplicate record to prevent injury to the surface of the duplicate record due to any longitudinal contraction thereof.

The claims which were in issue in the Connecticut suit No. 1103, were Claims 2 and 3 of Patent No. 713,209, which claims are as follows:

30 Claim 2: "The method of producing hollow cylindrical phonograms, which consists in obtaining a mold having a reverse phonogram-record on the inner wall of a cylindrical opening, forming a hollow cylindrical plastic phonogram within said mold, releasing the phonogram from the mold by a radial contraction of the pronogram sufficient to entirely clear the surfaces, and removing the phonogram from the mold by direct longitudinal movement."

40 Claim 3. "The method of producing hollow

cylindrical phonograms which consists in obtaining a mold having a reverse phonogram-record on the inner wall of a cylindrical opening, forming a hollow cylindrical plastic phonogram within said mold, releasing the phonogram from the mold by a reduction in temperature sufficient to entirely clear the surfaces, and removing the phonogram from the mold by direct longitudinal movement."

The process of the defendant in the Connecticut suit No. 1103 (likewise defendant here), which complainants alleged to infringe Patent No. 713,209 there in suit, was a casting process, in the practice of which molten or wax-like material was introduced between a mold and core and steam applied within a jacket surrounding the mold, and after a time the steam was turned off and cold water passed through the jacket to chill the duplicate record and shrink it so that it could be taken out of the mold. (Transcript Connecticut suit, No. 1103, pages 8 and 9.) Complainants contended in that suit that this casting process infringed the claims above quoted from Edison Patent No. 713,209, because, as was contended, casting a record is a species of "forming" a record, and these claims were directed to "forming" the duplicate record in the mold or matrix. Complainants also contended in that suit that the casting process then practiced by the defendant is the mechanical equivalent of the expanding process disclosed in the said Edison Patent No. 713,209.

Defendant, on the other hand, claimed that Edison Patent No. 713,209 was limited to the expanding process and did not include the casting process which they practiced; and that the casting and expanding processes were not the equivalents of one another, and in these views they were sustained by the decision of the court and the contentions of the



complainants on these points were overruled. Claim 3 of the Edison Patent No. 713,209 differs from Claim 2 of the same patent, as will be seen by comparing the two claims above quoted, only in that Claim 3 is limited to shrinking the duplicate record by a reduction in temperature, while Claim 2 is not so limited. (See testimony of defendant's expert, Cameron, Transcript in Case No. 1103, pages 464 and 465.) Claim 2, therefore, includes Claim 3, which is merely somewhat more specific, and whatever may be said regarding Claim 2 is applicable likewise to Claim 3. In fact, when the Edison and Joyce interference was declared by the Patent Office on this issue, it was stated that this claim "includes the patentable subject-matter of Claims 2 and 3." (Transcript of Connecticut case No. 1103, page 555.)

As has been stated by the defendant's witnesses, Mr. Edison obtained this claim in this patent as the result of an interference with the application which became the Joyce Patent here in suit, No. 831,688, Joyce having, in that interference, conceded priority of invention as defined by this claim to Mr. Edison. As this claim, which afterwards became Claim 2 of the Edison patent, was the only issue of the interference between the Edison application and this application of Joyce (there was another interference issue between the Edison application and a second application made by Mr. Joyce, as appears on page 555 of the Transcript of Record, but Claim 2 was the only claim which involved the Joyce application which eventuated in the patent No. 831,668), it follows that whatever was said or decided in the suit on Edison Patent No. 713,209, upon the issues there presented, applies directly to the only common subject-matter between the Joyce patent in suit and the said Edison Patent. Before continuing with respect to the Connecticut suit on

Patent No. 713,209, I may say that I do not go into the matter of the companion Connecticut suit, No. 1076, on Patent No. 667,662, at any considerable length, for, while this patent was granted to Mr. Edison upon a casting process, it was granted upon an application filed after the filing of the Joyce application, their respective dates of filing being May, 1900, and October, 1897. There was no interference between it and the Joyce application, and it, like Patent No. 713,209, contains no suggestion of the hot mold process of the Joyce patent. 10

In the Connecticut suit, No. 1103, defendant's expert witness, Cameron, repeatedly stated that Claims 2 and 3 of Patent No. 713,209 (and consequently, for the reasons already given, the matter common to that patent and the Joyce patent) have no application to a casting process, but relate only to the expanding or pressing process, which, he stated, is an entirely different thing. The following are some extracts from Mr. Cameron's testimony, taken from the transcript in the Connecticut suit, No. 1103, upon Patent No. 713,209, and indicating his views upon these subjects: 20

"The patent in suit appears to be based wholly upon the difference between *casting a molten material* into the mold, and introducing therein a *solid blank* which is *expanded* into close contact with the surface of the mold." 30  
(Page 459.)

"So far as the specification is concerned, the use of a liquid or molten material appears to be excluded from contemplation." (Page 460.)

"I, therefore, understand the second step of the claim (Claim 2) to mean bringing a solid *impressible* material (i. e., a material capable of being *molded* by the means in contemplation), into contact with the mold surface, as distinguished from bringing a liquid material into contact therewith and permitting the liquid to congeal. It is, to my mind, clear that 40



this is the line which the patent draws between what is included in and what is excluded from it." (Page 463.)

10 "I am clear that the expression 'forming' . . . 'a plastic phonogram within said mold,' as this expression is used in Claims 2 and 3 of the patent in suit, cannot be construed to include the act of pouring molten material into the mold and allowing said material to congeal."

20 "In my opinion, the step or operation described by the words 'forming a hollow cylindrical plastic phonogram' is broad enough to include any operation wherein a hollow blank in a solid state is expanded outwardly against the mold surface and receives the impress thereof, but not broad enough to include the operation of introducing a melted material into the mold and allowing it to congeal so as to receive the configuration of the relief on the interior of the mold." (Pages 467 and 468).

"I have already pointed out that in complainant's method a solid blank is pressed against the interior surface of the mold, whereas in the method followed by defendant a molten material is poured into the mold. These two steps are radically different, . . . ." (Page 504.)

30 "Referring to the conceded difference which I have pointed out in connection with the alleged fifth point of similarity, i. e., the difference between the pressing and the casting step, Mr. Dyer states that this is not of any importance since one is clearly suggestive of the other. With this opinion I cannot agree. The difference is, in my opinion, a very material one. The casting method is simpler, cheaper, and produces a better duplicate." (Page 505.)

40 The foregoing extracts are taken from different points in Mr. Cameron's testimony, which is quite a lengthy deposition, and will serve to indicate the position taken by defendant in the Connecticut suit

upon the invention defined by Claim 2 of Edison Patent No. 713,209, and therefore upon the matter common to this patent and to the Joyce patent in suit,—this claim, as I have already stated, being the issue of the interference between those parties. Mr. Massie, testifying as a witness for defendant, has testified that the process now practiced by defendant is the same as the process practiced by the defendant at the time of the bringing of the Connecticut suits and described in detail on pages 8 and 9 of the transcript of the Connecticut suit No. 1103 (this Record, page 288), and whether or not Mr. Massie is correct in his statement that these early and later processes of defendant are the same, each of them is a casting process making use of a hot mold and is within the claims of the Joyce patent in suit. It is apparent, therefore, that, if defendant was correct in urging and the court was correct in deciding in Connecticut case No. 1103, that defendant's casting process did not infringe Claims 2 and 3 of Edison Patent 713,209, Joyce's disclaimer of the subject-matter of these claims can have no effect on the claims now sued on, which are for a casting process, and, in addition, cover a process involving the use of a hot mold, neither of which are disclosed or even suggested in said patent No. 713,209 to Edison.

Counsel for complainants introduces in evidence the deposition of Shelton T. Cameron, taken in the suit of National Phonograph Company vs. American Graphophone Company, in the United States Circuit Court for the District of Connecticut, in Equity No. 1103, at Washington, D. C., beginning on March 16, 1904, and the same is marked:

"Complainants' Exhibit—Cameron Deposition in Connecticut suit on Edison Patent, No. 713,209."



It is stipulated that for the testimony from the Connecticut suits referred to in the foregoing stipulation, complainants may refer to the copies of the transcript of record marked for identification on behalf of defendant near the close of the deposition of defendant's witness, C. A. L. Massie, taken on January 8, 1908 (printed record, page 283), as:

10 "Defendant's Transcript in Connecticut suit on Edison Pressing Process," and—

"Defendant's Exhibit—Transcript in Connecticut suit on Edison Casting Process,"

with the same force and effect as if the said transcripts had been produced and marked for identification on behalf of complainants.

Counsel for complainants introduces in evidence the patents listed below, and the same are marked "Complainants' Exhibits," with the following respective designations:

20

#### U. S. PATENTS

No. 372,786 of Nov. 8, 1887, to Berliner,  
No. 382,417 of May 8, 1888, to Edison,  
No. 400,649 of April 2, 1889, to Edison,  
No. 460,338 of Sept. 29, 1891, to Heysinger,  
No. 606,725 of July 5, 1898, to Macdonald,  
No. 670,442 of Mar. 26, 1901, to Tainter.

30 British Patent No. 15,232 of 1887 to Berliner.

Complainants' counsel also introduces in evidence a copy, certified under the seal of the United States Circuit Court, for the Second Circuit, in the Southern District of New York, of affidavits of Edward D. Easton, C. A. L. Massie, Philip Mauro and Shelton T. Cameron, filed in a cause entitled "The American Graphophone Company vs. Wal-

40 cutt & Leeds, Ltd., et al," on March 3, 1908, and

the same is marked "Complainants' Exhibit—Certified Copy of Defendant's Affidavits in its suit against Walcutt & Leeds."

Complainants' counsel also offers in evidence a photograph of the core and one of the molds and one of the bases which were offered in evidence on behalf of complainants in connection with the testimony of Maurice Joyce, taken on February 24, 1908, and forming part of complainants' rebuttal proofs in these three suits, after the answer of the witness to Q-20 (printed record, page 336), and the same is marked "Complainants' Exhibit—Photograph of Joyce Original Mold, Core and Base."

10

Complainants' counsel offers in evidence two photographs of the Commercial Joyce Apparatus which was introduced in evidence on behalf of complainants in connection with the testimony of Martin Shannon, forming part of complainants' rebuttal proofs in these three suits and taken on March 4, 1908, after the witness's answer to X Q-24 (printed record, pages 327-8), and the said photographs are marked:

20

"Complainants' Exhibit—Photograph of Commercial Joyce Apparatus Unassembled," and—

"Complainants' Exhibit—Photograph of Commercial Joyce Apparatus Assembled."

Complainants' counsel also offers in evidence, in these three suits, three photographs of the mold and reaming tool offered in evidence in connection with the deposition of Peter Weber in the suit on Patent No. 683,615, and taken on November 1, 1905, and introduced in evidence at the close of the witness' answer to Q-9 of his deposition (printed record, page 20), and the same are marked:

30

"Complainants' Exhibit—Photograph of Weber's Reproduction of Defendant's Reaming Tool;"

40



"Complainants' Exhibit—Photograph of Weber's Reproduction of Defendant's Mold and Core Unassembled;"

"Complainants' Exhibit—Photograph of Weber's Reproduction of Defendant's Mold and Core Assembled."

10 It is stipulated that the said exhibits offered in connection with the Weber deposition in suit on Patent No. 683,615, at the close of the witness's answer to Q-9 of his deposition, and marked "Complainants' Exhibit—Weber Reproduction of Defendants' Mold," and "Complainants' Exhibit—Weber Reproduction of Defendant's Reaming Tool," may be used in each of these three suits with the same force and effect as if regularly introduced in each of the said suits.

20 It is stipulated that all testimony produced in these suits and filed by either party and in which the signature of the witness and the certificate of the Examiner are waived, may be filed by the Clerk with the same force and effect as if signed by the witness and accompanied by the proper certificate of the Examiner.

It is stipulated that counsel for neither party need serve briefs upon opposing counsel until the day of the argument upon final hearing.

30 Defendant's counsel consents to the foregoing stipulations without waiver of his right to make all proper objections thereto, and without waiver of the objection noted on December 8, 1908, before the deposition of Robert Fletcher Rogers, which latter objection is repeated to the foregoing stipulations.

40 Defendant's counsel objects to the stipulated testimony of David Dodd and of Frank L. Dyer, as well as to the exhibits offered in evidence, on the ground that the same are irrelevant and immaterial.

Mr. Dyer's stipulated reference to the decision of the U. S. Circuit Court for the District of Connecticut, in the so-called "Connecticut litigation," is further objected to as incompetent, on the ground that the opinion of that court (reported in 135 Federal Reporter 809) speaks for itself.

Complainants' Exhibit—Certified Copy of Defendant's Affidavits in its suit against Walcutt & Leeds, is further objected to as incompetent to prove any issue in the present litigation. 10

Complainants' counsel gives notice of the close of its rebuttal proofs, this 20th day of April, 1909.

HERBERT H. DYKE,  
*Of Counsel for Complainants.*

C. A. L. MASSIE,  
*Of Counsel for Defendant.* 20

30

40